University of Alberta

The Relationship of Teacher Education Variables, Screening, and Hiring Practices in Predicting First-Year Elementary Teacher Proficiency

by

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ABSTRACT

Every year, thousands of pre-service teachers graduate from teacher education programs and seek employment in the teaching profession. Hiring a person who is likely to become a good teacher is one of the most important decisions school board administrators must make.

There is little consensuses about which pre-service variables are most reliable in predicting first-year teaching proficiency. From a screening and hiring perspective this presents challenges. School boards are usually unable to observe a first-year candidate in a teaching context prior to offering an initial teaching contract. In most instances, school boards can only rely on specific pre-service variables commonly used for recruitment, screening, and hiring of new teachers.

Therefore, this study examined a group of 20 highly proficient first-year elementary teachers and a group of 20 least proficient first-year elementary teachers. It was believed that by examining these two divergent groups, on the continuum of teacher proficiency, differences would most likely be observed.

Historical data, contained in the personnel files of the participants being studied, were provided to the researcher. The data included university transcripts, student-teaching evaluations, and district screening and hiring information. From these data, 32 common pre-service variables were examined to determine their relationship to first-year teacher proficiency.

To evaluate the relationship of each independent variable with first-year teacher proficiency, Pearson Correlation Coefficients were generated to determine the magnitude and statistical significance of relationship between variables. Of the 32 independent

variables studied, 11 showed a significant relationship to first-year teacher proficiency. These 11 variables were selected for inclusion in a Discriminant Function Analysis. The Discriminant Function Analysis was used to develop an equation to classify and predict membership into either the highly proficient first-year teacher group or the least proficient first-year teacher group. The results of the discriminant score calculation predicted first-year teacher proficiency 92.9% of the time.

The results of this research study represent important findings to school boards in that teacher personnel selection decisions can be enhanced through the use of the predictive statistical model developed in this study. In addition, knowledge of which pre-service variables are related to first-year teacher proficiency has implications for the further development of teacher education programs.

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DEDICATION

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Finally I could not have completed this dissertation without the love of my Heavenly Father. "For I know the plans I have for you," declares the LORD, "plans to prosper you and not to harm you, plans to give you hope and a future"- Jeremiah 29:11.

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CHAPTER I

Introduction

Every year, thousands of pre-service teachers graduate from teacher education programs and seek employment in the teaching profession. Hiring a person who is likely to become a good teacher is one of the most important decisions school board administrators must make. So critical is the selection of a teacher to the quality of the educational program that it seems obvious that this decision should be made only with the utmost certainty. Yet, limited empirical data concerning the criteria utilized in the selection and hiring process of school boards is available (Heitritter, 2004).

In the face of growing consensus on the importance of the quality and proficiency of a teacher on student learning, reliable and valid hiring practices are essential. Although the hiring process is challenging for any employer, the stakes in education are particularly high. Research that examines which pre-service hiring variables can be used to predict first-year teaching proficiency is essential in ensuring a high quality teacher for every child.

Background of the Problem

As stated by President George W. Bush in the U.S. Secretary of Education's Third Annual Report (USDE, 2004), "Teachers are among the most important people in our children's lives, and a good teacher can literally make a lifelong difference" (p. 15). While this simple statement seems obvious, it is only recently that rigorous research evidence has begun to emerge to support what educators, parents, and students have already known: teachers are an important determinant of a child's education, and ultimately of the future economic health of a nation (McCaffrey, Lockwood, Koretz, & Hamilton, 2003).

There is a growing body of research that suggests teachers can and do make a difference in the achievement gains of students (Carey, 2004). Research highlights that academic achievement levels of students, who are taught by proficient teachers, are higher than the achievement levels of students who are taught by poor teachers. For example, Sanders and Rivers (1996) examined the cumulative effects of proficient teachers on student achievement in the area of mathematics. Over a three-year period, they followed the progress of a group of third grade students assigned to highly proficient teachers (top 20%) and least proficient teachers (bottom 20%). These students, regardless of background, were tracked to determine academic gains made from one year to the next. Teachers were considered to be proficient if they elicited appropriate gains in achievement for all their students. The results indicated that, by the end of the fifth grade, students who were, by chance, assigned to highly proficient teachers three years in a row, scored at the 83rd percentile in math. Students who were, by chance, assigned to least proficient teachers three years in sequence, scored at the 29th percentile in math.

In a study conducted by Jordan, Mendro, and Weerasinghe (1997), similar differences in achievement were found between students who had been taught by teachers of differing quality. The average reading scores of a group of students, who were assigned by chance, to three highly proficient teachers in a row, rose from the 59th percentile in fourth grade, to the 76th percentile by the end of sixth grade. A fairly similar group of students, who were assigned to least proficient teachers three years in a row, fell from the 60th percentile in fourth grade, to the 42nd percentile by the end of sixth grade.

Babu and Mendro (2003) reported that the difference between having a high quality teacher for three years in a row, versus having a poor quality teacher, can represent as much as 50 percentile points in student achievement. This can translate into a difference of a full grade level of achievement in a single school year (Hanushek, 1992). So large is the impact of teachers on student learning, that the American Association of State Colleges and Universities (AASCU, 2004) reported that teacher quality is the most important school factor affecting student learning. Darling-Hammond and Youngs (2002) reported that teacher quality is the most powerful factor in student learning, far outweighing class size and composition. This was supported by Rivken, Hanushek, and Kain (2002), who reported that being taught by a high-quality teacher throughout elementary school could substantially offset or even eliminate the disadvantage of low socio-economic background.

The implications of these research findings highlight the importance of ensuring only highly proficient teachers are hired to educate our youth (Darling-Hammond, 2002; Rice, 2003; USDE, 2002). All students deserve high quality teachers who will have a positive impact on student achievement. All students have the right to quality education. When inadequate teaching occurs, students fall behind academically. Such inequality in the opportunity for students to learn is difficult to justify or ignore, especially because the negative effects of a poor teacher on student learning appear to be cumulative, and generally not easily compensated for (Darling-Hammond & Sykes, 2003). This is substantiated by Sanders and Rivers (1996), who reported that even two years following, the academic performance of fifth grade students was still affected by the quality of their third grade teacher.

Previous research has indicated that approximately 5-15% of teachers in public schools are not performing at a competent level (Johnson, 1984). According to the U. S Education Secretary's annual report on teacher quality (USDE, 2002), just over half of the middle and high school teachers currently teaching met the No Child Left Behind (NCLB) definition of highly qualified. While there is a large discrepancy between these two statistics, if we assume that only 1% of teachers are not performing competently, in a large school district with approximately 5000 teachers and an average of 24 students in each class, this translates into 1200 students a year who are receiving poor instruction. Multiply this over a teaching career of 25 years and the seriousness of this problem is even more dramatic.

Local Issues Surrounding Teacher Quality

This study is based in this author's experiences as a consultant with a large urban school district in the Department of Staff Performance. Consultants in this department are responsible for providing advice and assistance to principals who are working with teachers with severe performance concerns, as measured against the Provincial Teaching Quality Standard (Appendix A). The assistance that this department provides, focuses largely on assisting principals in identifying the types of performance problems teachers are exhibiting, and developing remediation plans to assist teachers in improving their teaching practice.

Previous data collected by this department, revealed similarities with respect to the difficulties experienced by teachers who had severe performance deficits. These difficulties included problems with planning and organization, an inability to program to meet a range of learning needs, limited classroom management strategies, and an inability to assess student learning accurately. Although improvement in teachers' performance was the primary goal of this department, for some teachers improvement did not occur, resulting in the termination of their teaching contracts.

Over the years, it became apparent that the number of teachers who were identified as having severe performance difficulties in their first year of teaching was increasing. Each year, approximately three to five newly hired teachers were being identified as having performance concerns. This translated into one to two percent of newly hired teachers. As a result, this author's focus began to shift away from identifying and developing remediation plans for the problems these first-year teachers were demonstrating, to questioning on what basis these teachers had been hired by the School Board.

While it is important to examine how to improve teacher quality once teachers are in the profession, the first step to assuring all students have access to a high quality teacher begins with the successful identification of pre-service variables that could predict first-year teaching proficiency. Examination of these predictive variables might prevent least proficient first-year teachers from being hired to a school board in the first place, and might provide guidance for the further development of teacher education programs.

While educators agree that hiring proficient first-year teachers is essential in achieving quality learning, there is little consensus about which pre-service variables are most reliable in predicting first-year teaching proficiency. From a screening and hiring perspective, this presents challenges. For practical reasons, school boards are usually unable to observe a candidate in a teaching context prior to offering an initial teaching contract. School boards typically rely only on specific pre-service indicators commonly used for recruitment, screening, and hiring of new teachers. Thus, efforts to discover which pre-service hiring variables can be used to predict first-year teaching proficiency, is an area that requires further investigation.

Purpose of the Current Study

School board administrators involved in selecting and hiring teachers, seek the most qualified individual for each teaching position. For the most part, school boards are consistent in the information they review when hiring new teachers (i.e., university transcripts, student-teaching evaluations, application packages and interview information). However, there is a lack of empirical findings on which of these pre-service variables can reliably predict first-year teaching proficiency. Such lack of findings often results in mediocre selection decisions. Proficiency in identifying quality teachers requires clear and consistent research based knowledge. Therefore, the purpose of this study is to examine the common pre-service variables found in elementary teachers' personnel files, to determine which of these variables can predict those who will likely be highly proficient first-year teachers and those who will not.

To examine the predictive validity of pre-service variables and first-year teaching proficiency, a group of highly proficient first-year elementary teachers are identified and compared to a group of least proficient first-year elementary teachers. While the author recognizes that, within any group of first-year hires, the majority of teachers fall somewhere in between these two extremes, it is only by examining the most proficient and the least proficient, on the continuum of teaching proficiency, that significant differences are most likely to be observed.

University transcripts, the final student-teaching practicum evaluation, and the participating School Board's screening and hiring practices are investigated in this study. If differences exist between the extreme groups, it may be possible to identify which pre-service variables can reliably predict first-year elementary teacher proficiency.

It is important to note that this study does not propose to identify the attributes that constitute teacher quality once teachers are in the profession. Rather, the purpose of this study is to examine which pre-service variables can reliably predict first-year elementary teacher proficiency prior to an individual being hired by a school board.

Research Questions

1. By comparing a group of highly proficient first-year teachers to a group of least proficient first-year teachers, will differences be found between the types and number of subject matter courses they have completed?
2. By comparing a group of highly proficient first-year teachers to a group of least proficient first-year teachers, will differences be found between the types and number of education university courses they have completed?
3. By comparing a group of highly proficient first-year teachers to a group of least proficient first-year teachers, will differences be found between the grade point averages received in their university coursework?
4. By comparing a group of highly proficient first-year teachers to a group of least proficient first-year teachers, will differences be found between their final practicum evaluations?

5. By comparing a group of highly proficient first-year teachers to a group of least proficient first-year teachers, will differences be found between the screening and hiring information collected by school boards?
6. After examining identified pre-service variables between highly proficient and least proficient first-year teachers, can a new statistical screening and hiring model be established to predict first-year teacher proficiency?

Definition of Terms

For the purpose of this study, the following terms have been operationally defined:

Teaching Quality Standard

The Alberta Teaching Quality Standard (Appendix A) outlines the knowledge, skills, and attributes that teachers should possess and practice. It is the foundation for teacher evaluation throughout the province.

Quality/Proficient Teaching

For the purposes of this study, quality teaching and proficient teaching will be considered to be equivalent. "Quality (Proficient) teaching occurs when the teacher's ongoing analysis of the context, and the teacher's decisions about which pedagogical knowledge and attributes to apply, result in optimum learning by students" (Alberta Government, 1997, p. 4.2.1).

Highly Proficient First-Year Teachers

Highly proficient first-year teachers are defined as teachers who have been evaluated by their school principal as meeting the Teaching Quality Standard, have received a continuous teaching contract with the School Board, and also have been nominated to receive an award for excellence in first-year teaching.

Least Proficient First-Year Teachers

Least proficient first-year teachers are defined as teachers who have been evaluated by their principal as not meeting the Teaching Quality Standard despite support and intervention, have not been recommended for a continuous contract, and subsequently have had their employment with the School Board terminated.

Recommendation for a Continuous Contract

A school principal has determined that a teacher meets the Teaching Quality Standard and recommends him/her without reservation, for a contract that would permit the teacher, based on continued satisfactory performance, to retain a teaching position with the School Board for potentially the teacher's entire career. This recommendation is made based upon the basis that the principal believes the teacher will be proficient in a variety of schools and assignments and that the principal would be confident in recommending the teacher, without reservation, to other districts.

Non-recommendation for a Continuous Contract

The school principal has determined, based on the teacher's performance, that the teacher does not meet the Teaching Quality Standard and should not be issued a continuing contract. The principal does not recommend the teacher for any future teaching contracts with the School Board and the principal does not recommend the teacher for future employment as a substitute teacher.

CHAPTER II

Literature Review

There is much debate surrounding the preparation and attributes that characterize highly proficient teachers (AASCU, 2004; Darling-Hammond, 2002; Rotherman & Mead, 2003; Stronge & Hindman, 2003; Wise, 2003). The disputes have been embedded within two competing pedagogical philosophies: teachers are "made" vs. teachers are "born." In other words, a practical application of the so-called "nature versus nurture" controversy. In the literature, each side of the debate has endeavoured to construct its own warrant by highlighting only the research that supports their view. In addition, the content of the literature often involves undermining the other perspective by pointing out, in detail, where errors have been made and where data reported are inaccurate or incomplete. As a result, there is much ambiguity with respect to which variables are most likely to translate into proficient teaching performance (Cochran-Smith & Fries, 2001; Edwards, 2005).

Discovering which pre-service hiring variables can be used to predict first-year teaching proficiency requires further investigation. This chapter reviews the literature on the pre-service variables typically used by school boards when making selection and hiring decisions. These variables include university coursework, the final student-teaching practicum (sometimes referred to as field experience) evaluation and additional school board screening and hiring practices. More specifically, this literature review will examine the following variables and their relationship to teaching proficiency.

1. University Coursework: The types of courses pre-service teachers have studied and the grades received.

   - A. Non-Education Subject Matter Courses
   - B. Education/Methodology Courses

2. Practicum Evaluation: The final evaluation of how well student teachers did in their advanced professional term.
3. Screening and Hiring Practices: The practices used by a school board and the variables used to make teacher selection decisions.
   - A. Application Packages
     - i. Application Form
     - ii. Résumé
     - iii. University Transcripts
   - B. References
   - C. Interviews

It is important to note that the research data on prospective teaching candidates are limited, compared to the available research data on practicing teachers. Further research that examines the relationship of specific pre-service hiring variables to future teaching proficiency is required (AERA, 2005).

University Coursework

As stated in the University of Alberta Calendar (University of Alberta 2004),

> The Department of Elementary Education prepares teachers to teach all subjects and to facilitate the learning of all children at the elementary school level within our multicultural society. Teaching proficiency depends on knowledge of subject matter, pedagogy…

> and respect for children and the socio-cultural contexts in which
> they live. (p. 160)

Typically, elementary education programs provide teachers with coursework in subject matter knowledge (non-education courses) as well as coursework in teaching methodology (education courses). In these coursework areas, there are required courses that students take, as well as a range of courses that can be taken as options. It is through these options that students may choose courses that focus on how to teach students from diverse backgrounds, or students with special needs.

This section of the literature review will highlight research in the area of non-education subject matter courses, and education/methodology courses, and their relationship to teacher proficiency. In addition, this section will summarize the literature on grade point averages in university coursework and their relationship to teaching proficiency.

Non-Education Subject Matter Courses

Studies have been conducted to determine if the completion of subject matter courses is related to teacher proficiency. While there is some support for this assumption, findings in this area are not strong or consistent (Darling-Hammond, 2002; Rice, 2003; Shields et al., 2003; Wenglinsky, 2002). It is important to note that research on subject matter knowledge and its relationship to teaching proficiency has been undertaken almost exclusively in secondary education. While the research does not directly relate to elementary teacher proficiency, the data are important to consider, providing a view of the relationship of subject matter knowledge and teacher quality in general. Specific research on subject matter knowledge and how it relates to elementary teacher quality is required. To date, little research has examined what kind or amount of subject matter preparation makes elementary teachers more proficient (NCTQ, 2004).

Byrne (1983) summarized the results of 30 studies relating teachers' subject matter knowledge to teacher quality. Subject matter knowledge was measured either by a subject knowledge test, or by the number of subject matter courses completed. The results were ambiguous. Seventeen studies showed subject matter knowledge had a positive relationship to teacher quality and 14 studies showed no relationship. Byrne does not provide more than a tally analysis of the studies included and, it was suggested by Glass (2002), that a re-analysis using meta-analysis would be helpful.

Monk (1994) used data from 2829 secondary students that were collected from the Longitudinal Study of American Youth (NCES, 1992). Using a multiple regression analysis, he found that teachers' subject matter knowledge in the areas of Mathematics and Science, as measured by coursework in the respective subject fields, was positively related to teacher quality. Teacher quality was measured by gains in student achievement. He reported, however, that this relationship was curvilinear, with diminishing returns to student achievement above a threshold. Any more than five courses in a major did not have any affect on teacher quality.

In a multilevel analysis of the same data set, Monk and King (1994) found that low pre-test students' performance gains were more sensitive to the mean level of their teacher's subject matter preparation than was the performance of the high pre-test students. This may suggest that lower achieving secondary students may profit more from teachers who are well prepared in their subject matter than higher achieving students

(Glass, 2002). However, as stated by Monk (1994), "a good grasp of one's subject area is a necessary but not a sufficient condition for effective teaching" (p. 142).

In a study of 112 000 students, conducted through the National Longitudinal Study of Mathematical Abilities, Begle (1979) found that measures of teacher subject matter knowledge in the area of Mathematics did not have strong influences on teacher quality, as measured by student achievement. Begel found that coursework in Mathematics methodology had a stronger effect on student achievement than higher-level coursework in Mathematics subject matter.

Goldhaber and Brewer (2000) collected data from the National Educational Longitudinal Study (NCES, 1992), on students in 10th and 12th grade. Students in this study were tested in one or more of the following areas: Mathematics, Science, English/Writing, and History. The researchers found that junior and senior high school teachers, who had a major in the subjects that they taught, were more proficient than teachers who were teaching outside of their majors. Goldhaber and Brewer's research focused on secondary grades. They reported that the complexity of the content of the curriculum taught in secondary school, is undoubtedly greater than that taught in elementary school. While advanced education may be required to teach secondary content proficiently, the same depth of subject matter knowledge may not be required for elementary teaching.

This suggestion is further substantiated in a study published by the National Center for Educational Statistics (NCES, 1998). This study examined Mathematics achievement results of fourth-grade students. It was noted that fourth-grade students who were taught by teachers with a minor in Mathematics, did not perform better than students whose teachers did not have a minor in Mathematics. Conversely, eighth-grade students who were taught by a teacher with a major in Mathematics, outperformed students taught by a teacher without a major in Mathematics. These findings substantiate a study by Rowan, Correnti, and Miller (2002), who reported that additional subject matter knowledge of elementary teachers does not show significant impact on teacher quality.

One conclusion that may be drawn from these data is that a teacher's depth of knowledge in the subject matter they are teaching influences student achievement more in the upper grades than the primary grades. It may be, as the subject matter in the curriculum becomes more complex, more courses are required for teachers to gain a deeper understanding of the subject. However, further research as to whether the number and type of subject matter courses successfully completed in university are positively related to first-year elementary teacher proficiency is necessary.

Specifically, one area that requires further research is the relationship of subject matter knowledge in Social Sciences, to first-year teacher proficiency. A list highlighting specific Social Science undergraduate courses, is included in Appendix B. Recent demographic projections indicate that, more likely than ever before, teachers are required to teach children from different ethic backgrounds than their own (Ross & Smith, 1992). By the year 2010, the number of students from diverse cultures is expected to be 37% of the school-aged population (Voyles, 1997). Schools are required to provide a wide range of services to an increasingly diverse population. In response to this increase in diversity, educators must work differently than they have had to in the past, if they are to be proficient (ASCD, 2002). Baca and Cervantes (1984) and Garcia and Ortiz (1988) reported that ignoring differences in background experiences fosters academic failure rather than academic success for students. As a result, additional courses in the Social Sciences may provide a teacher with background knowledge that relates to the variety of social contexts found in a typical classroom. While there is limited research in this area, it is presumed by this researcher that increased knowledge in the Social Science area would have a positive relationship with teacher quality.

In summary, the research findings on whether subject matter knowledge is related to teacher proficiency are ambiguous. While, generally, junior and senior high school teachers with a major in the subjects that they teach, have higher achieving students than teachers who are teaching out of field (Goldhaber & Brewer, 2000), teachers' subject matter knowledge in elementary schools does not show significant effects on student achievement (Rowan, Correnti, & Miller, 2002). Therefore, it is hypothesized that additional subject matter knowledge, as measured by the number of subject matter courses completed in the area of Language/Literature, Mathematics and Natural Sciences will not be related to first-year elementary teacher proficiency. However, due to the increasingly diverse student population, it is predicted that there will be a relationship with the number of courses completed in the area of Social Sciences. While additional subject matter knowledge over and above the elementary program requirements may not be necessary, a basic level of competence in these subject matter areas is essential to first-year teacher proficiency. Therefore, it is predicted that the overall grade point averages in the required subject matter areas will be related to first-year teacher proficiency.

Education/Methodology Courses

University students enrolled in the elementary education program take general education and methodology courses on how to teach subject matter knowledge to students. There are a number of education courses students are required to take, and a number of education courses students can take as options. This section will summarize the research on education coursework and how it relates to teacher quality.

In July 2002, the U.S. Secretary of Education issued the Secretary's Annual Report on Teacher Quality (USDE, 2002). He argued for the dismantling of teacher education systems and the redefinition of teacher qualifications to include little preparation for teaching. The Secretary's annual report made these recommendations based on findings in a report by Walsh (2001). Walsh's report stated that previous research linking teacher preparation to measures of teacher quality was scientifically inadequate and surrounded by a great deal of contention. Walsh indicated that most of the studies were older, had relatively small samples, and used measures of performance other than student achievement scores.

Darling-Hammond (2002) rebutted Walsh's (2001) review and criticized Walsh's interpretations of the scientifically based research as flawed. She stated that Walsh's report was written to present a case against strengthening teacher preparation requirements and that Walsh only reported research that supported her case. A review commissioned by the Office of Educational Research and Improvement and conducted by Wilson, Floden, and Ferrini-Mundy (2001), supported Darling-Hammond's statement. The Wilson et. al. review analysed 57 studies that met specific research criteria and were published after 1980 in peer-reviewed journals. The researchers concluded that the available research evidence demonstrated a relationship between teacher education and teacher quality. This review documented relationships between teacher qualifications and student achievement across studies, using different units of analysis, different measures of preparation, in studies that controlled for student socio-economic status, and prior academic performance.

Several studies contradict the longstanding myth that "anyone can teach" and that "teachers are born not made." These studies highlight that teacher education matters a great deal. The most proficient teachers not only have adequate preparation in their subject matter, they also have studied the art and science of teaching (ASCD, 2002; Darling-Hammond 2002; Monk, 1994; Rice, 2003). Teachers who had greater education in teaching methodology were found to be more successful than those with less education in teaching methodology (Darling-Hammond 2000; Guyton & Farokhi, 1987; Riggs & Riggs, 1991). Teachers who spent more time studying teaching methodology were more successful in developing higher order thinking skills, deeper learning of the curriculum, and in meeting the needs of diverse students (Denton & Lacina, 1984).

Studies of teacher education programs support the notion that teachers who have completed more teaching methodology courses are found to be more successful than those with less. To substantiate, graduates from five-year programs who had completed extended coursework in teaching methodology were more proficient and more likely to enter and remain in teaching than graduates from four-year undergraduate programs. The teachers who had more coursework in teaching methodology produced significantly greater gains in student learning (Darling-Hammond & Berry, 1998).

Furthermore, Laczko-Kerr and Berliner (2002) compared the academic achievement of students taught by recently hired primary school teachers who were not certified and on emergency licences, to students taught by recently hired primary school teachers who were certified and had completed a teacher preparation program. Results of this study indicated that, in the area of Mathematics and Language-arts, students of certificated teachers who had completed teacher preparation program out-performed students taught by non-certificated teachers who had no formal preparation in education. In fact, students who were taught by non-certificated teachers demonstrated 20% less academic growth. This study further substantiates that teachers who have spent more time studying teaching methodology are more proficient than those who have not.

Other studies, examining the relationship between the completion of education coursework and the effects on student learning, also revealed consistent positive influences on teacher quality. Begle (1979) found that the number of credits a teacher had in Mathematics methodology courses was a stronger correlate of teacher quality, as measured by student achievement, than was the number of credits a teacher had obtained in Mathematics subject matter courses. While this study only looked at the area of Mathematics, it did substantiate the relationship of the completion of methodology courses to teacher quality.

Monk (1994) conducted a study that also highlighted the positive effect that education coursework had on teacher quality. This research highlighted that methodology courses were more influential on teacher quality, than additional subject matter courses taken over and above the mandated requirements. However, Monk, as cited in Darling Hammond (2002), highlighted:

> My study of relationships between teacher course taking experiences and subsequent student gains in performance showed that the number of both content courses and content-specific pedagogy courses in a teacher's background is positively related to pupil test score gains in the relevant content area. It is misleading to report the positive results for the content courses and to not acknowledge the positive results for the pedagogy courses. (p. 17-18)

Ferguson and Womack (1993) studied more than 250 candidates from a single teacher education program. This study examined the relationship of education and subject matter coursework to teacher proficiency. Subject matter specialists and education supervisors rated teacher proficiency on 107 items, based on detailed descriptors of teaching. The results revealed that the amount of education methodology courses completed by teachers explained more than 16.5% of the variance in teacher proficiency, than did measures of subject matter knowledge, which explained less than 4% of the variance. The results of this study confirm that education coursework has a stronger influence on teaching proficiency than subject matter coursework (Darling-Hammond, 2002).

In a similar study, Guyton and Farokhi (1987) compared the relationship of different kinds of knowledge on 12 dimensions of teacher performance. In their analysis of more than 270 teachers, Guyton and Farokhi found consistent, strong, positive relationships between teacher education coursework knowledge and teacher proficiency. Teacher proficiency was measured through a standardized observation instrument.

Druva and Anderson (1983) conducted a meta-analysis of 65 studies, which examined relationships between science teachers' education coursework and teaching proficiency. They used meta-analysis techniques to translate results from a wide range of studies into Pearson correlation coefficients, in order to compare them. Results of their research indicated that teaching proficiency was most strongly correlated with the number of education courses taken, followed by student teaching grades, and teaching experience.

In reviewing the most recent literature regarding the specific types of university courses which may have positive effects on teaching proficiency, the importance of completing courses that focus on how teachers can meet the multiple learning needs of the current student population is highlighted. In today's classrooms, there is an increase in students with a wide range of academic and physical abilities. Inclusion is often the first placement option and, thus, students with physical, emotional, and cognitive disabilities are being educated in the regular classroom (Lupart, McKeough, & Yewchuk, 1996). While there is limited research on the relationship between the number of Educational Psychology/Special Education courses completed and teacher quality, Wenglinsky (1996) reported that students whose teachers had strong content knowledge and had learned to work with students from different cultures and students with special needs, tested more than one full grade level above their peers.

Unfortunately, many teachers in today's classrooms feel they are not adequately prepared to meet the special learning needs of the students in their classroom (Vaughn, 1996). In a report on the Preparation and Qualifications of Public School Teachers (Lewis et al., 1999), 21% of the respondents felt well prepared to meet the needs of students with disabilities, despite the fact that 71% of these respondents taught students with disabilities. While these findings are unsettling, they are consistent with reports from Bynoe (1998). He, too, reported that many educators are not particularly knowledgeable about the changing school age population and thus are having difficulty meeting the needs of students from different cultures and students with special learning needs.

In summary, conclusions from the highlighted research suggest that education/methodology courses positively affect teaching practice and student learning. However, further research is required as to whether the number and types of education courses successfully completed in university can differentiate highly proficient first-year elementary teachers from least proficient first-year elementary teachers. Based on the literature review, and for purposes of this study, it is hypothesized that the overall number of Education/Methodology courses and the number of Educational Psychology Courses completed will be positively related to first-year elementary teacher proficiency.

Overall Grade Point Average

Simply studying the completion of coursework and its relationship to teacher quality is too limiting. Studying grade point averages received in the coursework may reveal valuable information that can be used to discriminate teacher quality. How well one does in coursework is an indication of mastery of the subject matter. Although the research, in general, has consistently shown a positive relationship between teachers' academic ability and teacher quality (Strauss & Vogt, 2001), the research has been limited. While academic ability is important, the evidence does not establish that it is the only important contributor or the most efficient way to achieve teacher quality. Indeed, most systems combine general academic ability, subject matter, and teaching knowledge, with evidence of successful student-teaching experiences to help determine teacher quality. The research findings on academic ability and teacher proficiency are summarized below.

Some educators have questioned the premise that high grades in university studies and proficient teaching are related. Dobry, Murphy, and Schmidt (1985) compared education students' overall grade point averages to their student-teaching evaluations. While the two were positively related, the relationship was not statistically significant.

Schalock (1979) and Soar, Medley, and Coker (1983) reviewed a number of studies dating as far back as the 1940s that examined the relationship of general academic ability to teacher quality. They, too, found that, while the studies consistently showed a positive correlation between teachers' academic ability and teacher quality, most relationships were not statistically significant.

Guyton and Farokhi (1987) examined the relationship between academic performance and teaching success in a sample of over 400 graduates of a university teacher education program. The results showed that teachers' grade point average was positively correlated with teacher proficiency, as measured by a performance-based assessment, required for continuing state certification.

A study conducted by Riggs and Riggs (1991) investigated measures obtained from students' files of 437 out of 800 students admitted to an elementary teacher education program. The researchers reviewed variables such as undergraduate overall grade point averages, scores from the California Basic Education Skills test, grades from prerequisite education courses (such as Educational Psychology courses and Reading methodology courses), and scores from the U. S. National Teachers' Exam. Results of this study indicated that, while the overall undergraduate grade point average did not seem to be related to student teacher quality, grades obtained in Educational Psychology and Reading methodology courses produced consistent and significant correlations with student-teaching success, as measured by student-teaching evaluations. The grade point averages in Reading methodology courses were the most successful predictor of successful student-teaching performance.

Perry (1981) stated that individuals involved in hiring teachers will examine university transcripts and often give preference to those who have average or even below average grades. While such a practice seems questionable, Perry reported that this is done because there is sometimes a belief that, if someone is too scholarly, he/she may not successfully relate to students. Seyfarth (1996) refuted this statement and reported that, although a high grade point average is not a guarantee that a teacher will be proficient in the classroom, it has been found that, other things being equal, teachers who had above average grades in their university courses generally had students who achieved better than teachers who received average or below average grades in university courses. Tracy and Walsh (2004) highlighted that final grades assigned upon completion of a course can be used as a reliable measure of the knowledge acquired.

In summary, the findings from previous research indicate that academic ability and teacher proficiency are related. Therefore, it is hypothesized that higher university grade point averages will be positively related to first-year teacher proficiency. Specifically, when examining education courses, the literature would suggest that higher overall grade point averages in Educational Psychology courses, Reading methodology courses and Education/Methodology courses, would be positively related to first-year elementary teacher proficiency.

Practicum Evaluations

Evaluation of student-teachers is an integral part of teacher preparation. University practicum evaluations should be able to distinguish among outstanding, average, or below average student teachers. An important question lies in whether the evaluation of student-teaching can yield significant information about the strengths and weakness of student-teachers in ways that provide accurate and reliable judgment of pre-service teaching ability.

Raths and Lyman (2003) stated that summative evaluations of student-teachers are not widely respected. They concluded that student-teaching evaluations are not useful in preventing weak and incompetent student teachers from entering the teaching profession. This conclusion is further supported by Guyton and McIntyre (1990), who reported that studies revealed little credence in the validity of student-teacher evaluations. They stated that teacher preparation programs do not always have instruments that yield accurate and consistentappraisals of student-teaching performance. Thus, student-teachers are not always being provided valid information about their performance. This implies that some student-teachers may not even be aware of any performance concerns, and thus would be unable to correct the difficulties that could ultimately interfere with proficient teaching practices.

Raths and Lyman (2003) stated that negative summative judgements about student-teachers are rare. This is consistent with previous findings from research done by

Johnson and Yates (1982), which revealed that failure of student-teachers has traditionally been uncommon in teacher preparation institutes.

Table 1

Percentage of Universities that Fail a Student Teacher

Universities that NEVER fail a student	15%
Universities that fail < 1%	50%
Universities that fail >1%	15%

Knowles (1992) reported that cooperating teachers often support mediocrity by assigning passing grades to student-teachers. Katz and Raths (1992) reported, "Some cooperating teachers will accept almost any level of student-teaching performance and reward the candidate with positive support and warm feedback" (p. 378). This statement is consistent with previous research done by Phelps, Schmitz, and Boatright (1986) and Wheeler and Knoop (1982). They examined student-teacher evaluations and found rater errors of lenience and positive ratings due to the halo effect. The halo effect refers to the tendency to rate a person's skills and talents in many areas based upon an evaluation of a single factor. Chang and Ferre (1988) reported that in 135 evaluations of student-teaching, cooperating teachers assigned virtually no below average grades.

Raths and Lyman (2003) cite a number of reasons why poorly performing student-teachers often receive positive comments on their student-teaching evaluations. One reason is because cooperating teachers serve a dual role. On one hand, their role is to be a mentor and coach. Cooperating teachers are expected to provide advice and assistance and to encourage the student-teacher to share any concerns and difficulties with them. The cooperating teacher's role is to coach the student-teacher to success. On the other hand, the cooperating teacher's role is also to provide a summative/final evaluation of the student-teacher's performance. These are conflicting roles, especially when the student-teacher is not experiencing success. For example, in the beginning of the practicum experience, the cooperating teacher provides the student- teacher with guidance and feedback. The cooperating teacher does everything in his/her power to facilitate the success of the student-teacher. However, by the end of the practicum, if the student-teacher has not been successful, the cooperating teacher is required to shift from being supportive to evaluative. These dual roles are difficult to fulfill. In the end, the cooperating teacher must make a decision whether to pass or fail the student-teacher.

There are a number of pressures brought to bear in the decision to fail or not fail a student-teacher (Gray, 1998). For example, the decision to fail a student-teacher may lead the cooperating teacher to believe that he/she was not a proficient coach or mentor, that the placement itself did not allow the student-teacher to demonstrate his/her skills, or that the cooperating teacher was too harsh in his/her evaluation of the student-teacher's performance. In addition, the decision to fail a student-teacher could result in the student-teacher appealing the evaluation. Because of these factors it is reasonable to assume that, more often than not, cooperating teachers will blame themselves for the poor performance of a student-teacher and will rarely make the decision to fail a poorly performing student-teacher. This decision is made largely because of rater bias, due to the relationship established between the cooperating teacher and the student-teacher, as well as an educational paradigm that encourages high grading regardless of performance (Johnson &Yates, 1982).

The research in the area of student-teaching evaluations indicates that there is clear acknowledgement of difficulties experienced by cooperating teachers in determining the quality of student-teaching. A study conducted by Brucklacher (1998) examined 465 evaluations of student-teachers using a 20-item instrument. All evaluations resulted in ratings that were above average on all items and an overall mean score of 3.63 out of a possible 4. These ratings implied that all of the student-teachers qualified as "cum laude," which is highly unlikely.

Furthermore, examination of the written comments that had been provided by the cooperating teachers revealed that 108 were positive and approving in nature and only 14 were negative or critical. Negative comments focused mainly on a teacher's professionalism (i.e., being on time for supervision, confidentiality issues, etc.), lack of effort, or addressed a student teacher's inability to manage the classroom (Brucklacher, 1998).

Another reason, cited by Raths and Lyman (2003), for the problems associated with accurately evaluating student-teaching performance is the fact that there is uncertainty in the criteria being used to evaluate student-teaching. The indicators that distinguish highly proficient student-teaching from marginal student-teaching from least proficient student-teaching are not distinct. It is extremely difficult for a cooperating teacher to make such a high-stakes decision to fail a student-teacher with only vague decision rules. This is further supported by Guyton and McIntyre (1990), who also stated that practicum evaluations are sometimes deemed to be invalid and unreliable because the criteria used for the evaluation of student-teachers are not explicit. Isele (1992) reported that many evaluation forms do not measure what they say they measure because they are not founded on valid research findings.

In summary, previous literature highlights that student-teaching evaluations are not reliable or valid measures of teacher quality. In fact, the literature supports the development and utilization of a more precise system of evaluation. Based on the literature available, and for the purposes of this study, it is hypothesized that student-teaching evaluation reports will not be related to first-year teacher proficiency.

Screening and Hiring Prospective Teaching Candidates

In the next decade, the United States alone will need to hire more than two million teachers in order to handle enrolment increases, to replace an aging teaching workforce, and to respond to the chronic attrition of new teachers (Darling Hammond, 1998). This phenomenon is not isolated to the United States. Schools across Canada, Europe and Australia are also concerned about potential teacher shortages (Swiniarski, 2001). Such being the case, recruiting and hiring are important aspects of the education system.

School board administrators involved in selecting and hiring teachers are seeking the most qualified individual for each teaching position. School boards review similar information when hiring a new teacher (i.e., transcripts, student-teaching evaluations, application packages, interview information, letters of reference, etc.). However, limited research is available that investigates which variables from these data can differentiate potentially proficient first-year teachers from least proficient first-year teachers.

Lack of empirical research into which pre-service variables can predict first-year teaching proficiency can lead to hiring practices that may not be reliable. Seyfarth (1996) stated that proficiency in identifying quality teaching and selecting potentially proficient teachers requires highly refined knowledge and skills. Relying solely on intuition rather than research will, at best, result in mediocre selection decisions. There is limited research available about teacher selection practices. It has been noted that not a single theory related to performance prediction has withstood, consistently, the test of empirical scrutiny (Peterson, 2002). The following section will, therefore, look at the literature with respect to selection and hiring practices currently in use by school boards.

A study by Ralph, Kesten, Lang, and Smith (1998) examined the qualities Canadian school administrators seek in prospective teachers. They examined principals' views of eight elements of university teacher education. Results indicated that the most important pre-hiring elements administrators looked for were the final practicum evaluation, followed by the specific courses taken in university. Areas that were rated as moderately important were mid-term reports from the practicum experience, how high the individual's grades were in university coursework, involvement in on-campus extracurricular activities, and earning a degree in addition to a bachelor of education. Of low importance was the university the candidate attended.

The Ralph et al. (1998) study also examined the weight placed on various performance indicators when short-listing candidates. Of highest importance when short listing candidates was the final evaluation of the student-teaching, a telephone call to the cooperating teacher verifying the written evaluation of the practicum, and the candidate's performance in an interview. Next in importance were the narrative comments on the final evaluation of the practicum, followed by information found in the candidate's résumé, and reports from reference documents. University grades were ranked as least important but still had a moderate rating.

Furthermore, administrators in the Ralph, Kesten, Lang, and Smith (1998) study were asked to rank the degree of importance of 18 generic teaching skills. Of the 15 skills that were ranked as high in importance, more related to the human dimension than the technical aspects of teaching. The results revealed that administrators ranked the ability to establish and maintain a positive learning climate as more important than overall academic achievement, university grades, and instructional ability, when screening and hiring new teachers. Stronge and Hindman (2003) reported six research-based domains of teacher quality that could be used to guide the teacher selection process. The six areas included teacher as a person, classroom management and organization, organizing for instruction, implementing instruction, and monitoring student progress and potential.

Seyfarth (1996) stated that personnel departments within school districts usually conduct the screening of prospective teachers. Some of the information, which typically contributes to the selection decision, includes, but is not limited to:

1. Application Package: (application form, résumé and university transcripts) The application package provides information on an individual's educational background and work history. It identifies that an individual has completed the required courses of study and highlights the types of courses taken and the academic achievement in these areas.
2. References: Reference documents verify employment history and can assist in determining the knowledge and skills an applicant has demonstrated.

3. Interviews: Assist in identifying teaching ability through responses to hypothetical questions and situations.

Application Packages

Travers (1987) surveyed teacher employment applications of 41 school districts, in order to apprise prospective teachers of factors school districts desire in potential employees. His findings suggest that much of the information used to screen potential teaching candidates is obtained via the interview as well as the application package. Travers stated that successful experiences outside school are important to school districts. If a candidate identifies an interest in people, possesses a diversity of skills and interests, and has a commitment to teaching, he or she is considered well prepared for successful employment. Often, prior volunteer experiences, work experiences, and extracurricular experiences are taken into consideration. Furthermore, scholastic achievement is expected, and transcripts are reviewed but, by itself, scholastic achievement is insufficient as a criterion for selection of a teacher. Affective skills are important. Future teachers should be scholarly but balance is needed.

References

In the literature, there has been debate over the value of personal references in the employee selection process. Some individuals support the importance of personal references as sources of information about job applicants. Aamodt, Bryan, and Whitcomb (1993) argued that references could be used to predict performance and Watts (1993) stated references help select the right person for the job. However, Seyfarth (1996) stated that a major weakness is that references only highlight positive information and the validity of the information is often questionable. No one would knowingly provide a list of reference names or submit reference letters highlighting negative information about him/herself.

Herman (1994) stated that the most reliable information often was produced by reference checks done by telephone, because these elicited more honest information than written references (Hernadez & Bozeman, 1989). Findings by Halitin and Abrahamson (1995) suggest that the cooperating teacher is regarded as the most important, credible source for providing both oral and written information about the applicants who have just completed student-teaching. Character references from leaders of volunteer organizations or from pastors received the lowest ratings.

Interviews

In order for interviews to be a proficient tool in the screening process, interview questions must be job relevant, the same questions must be asked of all applicants, and a system for recording and storing interview information is required. A system of this sort will assist in avoiding interview bias towards the prospective teaching candidate. It is also suggested that the individuals conducting the interviews be trained in the interview process, in order to increase the validity of the information obtained (Seyfarth, 1996).

One way that interview validity can be increased is by the use of behaviour descriptive interviews (Janz, 1989). This process involves asking questions about events in which the applicant has actually been involved. This method predicts how the person will act in a similar situation in the future. An example of a behavioural descriptive interview question might be, "In your practicum, how did you teach your third graders language arts?" or "What routines did you have established in your classroom and how did you teach them to your students?" Since all teachers will have had practicum experience during university preparation, descriptive behavioural interviews will likely be the most efficient, with benchmark answers established for each question.

Sometimes, during the interview process, a question is asked requiring the applicant to explain his/her philosophy of teaching. Literature states that this response is often rehearsed and unreliable. A more proficient way of gaining accurate insights about an individual's teaching philosophy is to ask questions about past teaching behaviour (Seyfarth, 1996). Interviewing strategies and styles vary by school district. Some personnel officers evaluate applications first for scholastic performance and quality of written recommendations, at which point the more highly rated applications are forwarded to principals for interviews.

A recent study from the New Teacher Project (Levin & Quinn, 2003) suggests that, there are major flaws in local hiring processes. This detailed study of personnel hiring practices of a group of large urban school districts found that, because of complex work rules relating to rigid job posting requirements negotiated in collective bargaining contracts, districts often delayed offering jobs to qualified teachers for months and months at a time. As a result, many of the most qualified teachers took more timely offers from surrounding suburban districts. A follow-up survey found that these teachers would have preferred to work in the urban district. For every month that the urban districts delayed in offering a job, the overall talent in the candidate pool shrunk with the best prospective teachers being the first to be hired by other districts.

Since we cannot fairly assess how proficient teachers will be before they have actually taught, we need to ensure a baseline level of quality for new teachers. While the prospect of having applicants teach a class as a demonstration of their teaching skills would be a valuable part of the screening and hiring process, school boards do not typically engage in this practice. Such being the case, further research, into which criteria from typical screening and hiring practices, can predict those who will be highly proficient in their first-year of teaching from those who will be least proficient in their first year of teaching, is required. However, based on the highlighted research and for the purposes of this study, it is hypothesized that the information gathered from application packages and interviews will be positively related to first-year elementary teacher proficiency, but letters of reference will not.

Summary of Literature Review

It is clear from the literature review that research in the area of university coursework and grade point averages, student-teaching practicum evaluations, screening, and hiring practices of school boards and their relationship to teacher proficiency, is limited. While further research in these areas is required, the outcome of the literature review has resulted in the following points that may have pertinence to this research study.

University Coursework:

- Generally, junior and senior high school teachers with a major in the subjects that they teach have higher achieving students than teachers who are teaching out of field (Goldhaber & Brewer, 2000). However, teachers' subject matter knowledge in elementary schools does not show significant effects on student achievement (Rowan, Correnti, & Miller, 2002).
- Coursework that provides teachers with additional knowledge about cultural, political, and ethical foundations of education would assist potential teachers in

developing their understanding of the complex contexts within which schools are embedded (National Council for Accreditation of Teacher Education, 1997).

- Teachers who had greater education in teaching methodology were found to be more proficient than those with less education in teaching methodology (Darling-Hammond 2000; Guyton & Farokhi, 1987; Riggs & Riggs, 1991).
- While there is limited research on the relationship between the number of Educational Psychology courses completed and teacher quality, Wenglinsky (1996) reported that students whose teachers had strong content knowledge and had learned to work with students from different cultures and different special needs, tested more than one full grade level above their peers.
- Overall undergraduate grade point averages are related to teacher proficiency (Seyfarth, 1996; Guyton & Farokhi, 1987; Dobry, Murphy, & Schmidt, 1985).
- Grade point averages in Reading Methodology courses and Educational Psychology courses show a significant positive relationship to student-teaching proficiency (Riggs & Riggs, 1991).

Student-teaching Practicum:

- Practicum evaluations of student-teaching may not provide accurate and reliable discrimination of teacher quality (Brucklacher, 1998; Katz & Raths, 1992; Knowles, 1992; Guyton & McIntyre, 1990; Raths & Lyman, 2003).
- Failure on student-teaching evaluations is relatively uncommon. There are virtually no below average grades. This may be due to an educational paradigm that encourages high grading regardless of performance (Johnson & Yates, 1982; Katz & Raths, 1992; Knowles, 1992; Raths & Lyman, 2003).

Screening and Hiring Practices

- There is limited research about teacher selection and hiring practices available.
- Personnel departments typically use application packages (application form/transcripts/résumé), references, and interview information, to contribute to the selection decision (Seyfarth, 1996). The most important pre-hiring element is the practicum evaluation, followed by the specific courses taken in university (Ralph, Kesten, Lang, & Smith, 1998).

Hypotheses

Based on the summary of the literature review, this research study was conducted to investigate the following hypotheses.

H1: When examining non-education subject matter courses, it is predicted the number of Social Science courses will be positively related to first-year elementary teacher proficiency.

H2: When examining non-education subject matter courses, it is predicted that grade point averages, in all subject matter areas, will be positively related to first-year elementary teacher proficiency.

H3: When examining required education courses, it is predicted that grade point averages, in all of the required education courses, will be positively related to first-year elementary teacher proficiency.

H4: When examining optional education courses, it is predicted that the number of Education/Methodology and Educational Psychology courses completed will be positively related to first-year elementary teacher proficiency.

H5: When examining optional education courses, it is predicted that overall grade point averages in Educational Psychology courses and Reading Methodology courses will be positively related to first-year elementary teacher proficiency.

H6: When examining overall university grade point averages, it is predicted that the overall university undergraduate grade point average will be positively related to first-year teacher proficiency.

H7: When examining student-teaching practicum evaluations, it is predicted that the evaluations will not be related to first-year elementary teacher proficiency.

H8: When examining the quantitative numbers assigned by the School Board during the screening and hiring of new applicants, it is predicted that the information gathered from application packages and interviews will be positively related to first-year elementary teacher proficiency, but letters of reference will not.

H9: When all of the variables that have statistically significant relationships to first-year elementary teacher success are used in Discriminant Function Analysis, the equation will predict successful membership into the highly proficient first-year teacher group or least proficient first-year teacher group 65% of the time or more.

CHAPTER III

Methodology

As this study entailed a review of historical information contained in personnel files of individuals who have been employed with a school board, there was no direct contact with the participants. This condition was prescribed by ethical considerations and procedures outlined in the Freedom of Information and Protection of Privacy Act. Such being the case, follow-up interviews with the participants could not be conducted to clarify research questions, or to add qualitative data to the research findings.

Sample

Two groups of first-year elementary teachers were identified. Group 1 (coded as 1) consisted of teachers who were identified by the School Board as being highly proficient in their first-year of teaching. Highly proficient teaching was operationally defined as demonstrating an ability to meet the Provincial Teaching Quality Standard, receiving a continuous teaching contract with the School Board, and being nominated to receive an award for excellence in first-year teaching. Group 2 (coded as 0) consisted of teachers who were identified by the School Board as being least proficient in their first-year of teaching. Least proficient teaching was operationally defined as not demonstrating an ability to meet the Provincial Teaching Quality Standard, not being recommended for a continuous contract, and being terminated from future employment with the School Board.

All of the participants in this study were elementary teachers who were chosen from a list of individuals who met the specified criteria during the 2001-2004 school years. Based solely on the established criteria, 20 teachers were assigned to the highly proficient first-year teacher subject group and 20 to the least proficient first-year teacher group. The selection of the participants was conducted by the School Board, starting first by identifying teachers from the 2004 school year and moving backwards in time until 20 subjects for each group were selected.

Predictor Variables

Data were collected on 32 independent variables. These variables, outlined in Table 2, were classified into three categories: 1) Subject Matter Courses, 2) Education/Methodology Courses, and 3) Screening and Hiring Information.

Table 2

Predictor Variables

Subject Matter Courses
Number of Language/Literature Courses Completed
Language/Literature - Overall Grade Point Average
Number of Mathematics Courses Completed
Mathematics - Overall Grade Point Average
Number of Social Science Courses Completed
Social Science - Overall Grade Point Average
Number of Natural Science Courses Completed
Natural Science - Overall Grade Point Average
Education/Methodology Courses
Grade Point Average - Introduction to Teaching Course
Grade Point Average - Required Reading Methodology Course
Grade Point Average - Required Mathematics Methodology Course

Grade Point Average - Introductory Social Studies Methodology Course

Grade Point Average - Introductory Science Methodology Course

Grade Point Average - 4 Core Methodology Courses (Reading/Math/Social/Science)

Grade Point Average - Required Introductory Educational Psychology Course

Grade Point Average - Required Educational Psychology Adapting Instruction Course

Grade Point Average - Required Educational Psychology Assessment Course

Grade Point Average - Required Educational Policy Studies Managing the Learning Environment

Grade Point Average - Required Educational Policy Studies Ethics in Teaching Course

Grade Point Average - Required Computer Course

Number of Educational Psychology Courses Completed

Overall Educational Psychology Grade Point Average

Number of Education Methodology Courses Completed

Number of Reading Methodology Courses Completed

Grade Point Average - Overall Reading Methodology Courses

Grade Point Average - Last Session

School Board Screening and Hiring Information

School Board's Rating of Overall University Grade Point Average - score out of 15

School Board's Rating of Coursework Variation From Transcript - score out of 5

School Board's Rating of Practicum Evaluation - score out of 30

School Board's Rating of Resume/Biographical Information - score out of 10

School Board's Rating of Interview- score out of 40

School Board's Overall Screening and Hiring Total - score out of 100

Dependent Variable

One dichotomous dependent variable was examined in this study, first-year teacher proficiency.

1. Highly proficient teaching (coded as 1).
2. Least proficient teaching (coded as 0).

Data Collection and Procedures

The data collected for this study included university transcripts, final student-teaching evaluations, application packages, initial interview reports, and quantitative numbers assigned during the screening of teacher applicants. All data were collected in compliance with the procedures outlined in Alberta's Freedom of Information and Protection of Privacy Act. The data collected were provided to the researcher with all identifying information removed.

Procedures For Observing Ethical Guidelines

The data used were located in the School Board's Head Office. A School Board employee was assigned to be in charge of protecting the information and served as a "gatekeeper," addressing anonymity and confidentiality issues and providing the data to the researcher with all identifying information removed. All information that would identify an individual, a school, or any third party, was removed. Codes 1 (highly proficient first-year teachers) and 0 (least proficient first-year teachers) were used to categorize participants into the two comparison groups. In addition, confidentiality of the University and the School Board was ensured through the use of generic terms: the University, the School Board. The gatekeeper, the researcher, and the University advisor ensured all ethical guidelines were followed.

Obtaining informed written consent from participants was not necessary for this study. The issue of informed consent to access personnel files was addressed at a District level and the School Board's lawyer was consulted. When participants were hired by the District, they were made aware of the type of information that would be collected in their personnel files and gave consent to the School Board to use and release this data to other School Board leadership personnel, as long as the School Board followed procedures outlined in the Freedom of Information and Protection of Privacy Act.

Data Analysis

To evaluate the relationship of each independent variable with first-year teacher proficiency, Pearson Correlation Coefficients were generated to determine the magnitude and statistical significance of relationship between variables. Before conducting a correlation analysis, the researcher had developed a theoretical perspective, based on the literature review, regarding which independent variables should relate to first-year teacher proficiency. These hypotheses were highlighted after each section in the literature review. In most cases, the correlation analysis showed that these variables were significantly positively related to first-year teacher proficiency, supporting the theoretical perspective regarding the data. However there were some unexpected results, which will be discussed further in Chapter V.

Based on the correlation analysis, the reduced number of statistically significant variables was evaluated for general linear model assumptions, using histograms and scatter plots for each independent variable for each group. This approach is recommended (Grimm & Yarnold, 1995) when pursuing the use of multivariate statistical methods, such as Discriminant Functional Analysis. In general, the independent variables were found not to violate general linear model assumptions. However, there were significant variables that encompassed other significant variables (e.g., a summary variable of a teacher's GPA which included the individual GPAs of specific courses). These variables, which are discussed further in Chapter IV, were removed from consideration for use in the Discriminant Function Analysis, as they violated the assumption of independence. In addition, for replication purposes, it is important to report that missing data were an issue for the grade point average obtained in the Educational Psychology Assessment Course. Many of the subjects had not completed this course and thus a grade point average could not be reported. This variable was recoded into a dichotomous variable, which classified subjects as to whether or not they had completed the Assessment course.

The statistically significant variables identified from the Pearson Correlation Coefficients were further analysed using Discriminant Function Analysis. This statistical procedure was used to develop an equation to classify and predict membership into either the highly proficient or the least proficient first-year teacher group.

Chapter IV

Research Findings

The findings of the data analysis are presented in this chapter. The purpose of the analysis was first to examine various pre-service variables and their relationship to predicting first-year teacher proficiency. The variables found to be most related to teacher proficiency were then used in a Discriminant Function Analysis.

Data were collected on 32 independent variables. A Pearson Correlation Coefficient analysis was conducted on each of these independent variables, to determine which showed significant relationships with first-year teacher proficiency. The results of the Pearson Correlation Coefficient analysis will be discussed under the categories in which the variables were classified. The organization of the results for the Pearson Coefficient analysis begins with the hypotheses and a statement about the data that were analysed. The results are summarized in a chart, and the numerical summaries of specific aspects of the data follow. This section ends with a summary chart highlighting the variables that showed statistically significant relationships with first-year teacher proficiency.

The statistically significant variables from the Pearson Correlation Coefficient analysis were selected for inclusion in the Discriminant Function Analysis. The results of the Discriminant Function Analysis findings will be summarized following the results of the coefficient analysis. Each independent variable and its relative importance and relationship to the discriminate function, which defines first year teacher proficiency, will be discussed. The construction of a predictive Discriminant Function Analysis equation and its ability to assign a probability of group membership into the highly proficient or least proficient first-year teacher group will also be highlighted. The implications of the research findings and their relationship to the literature review are discussed in detail in Chapter V.

Pearson Correlation Coefficient Analysis

It is important to note that, not all participants in this study completed all of the identified required courses. This is because the participants attended a variety of universities/colleges and the required courses for each institution varied. In addition, there were cases in which the files of data that were provided to the researcher for each participant contained transcripts in which the final grades had not been confirmed. In such situations, the data were not included in the data analysis. These anomalies reflect why the data analysis sample sizes are not at 20 for each group and for each course area being studied. Missing data are a recognized problem with the data set used in this study. In addition, all universities did not use the same grading system. Final marks that were reported in letter grades were converted to a 9-point system.

Subject Matter Courses

H1: When examining non-education subject matter courses, it is predicted the number of Social Science courses will be positively related to first-year elementary teacher proficiency.

The non-education subject matter courses that pre-service teachers are required to complete were analysed to determine if there was a statistically significant relationship to first -year teacher proficiency. The numbers of courses taken in non-education required subject matter areas of Language/Literature, Mathematics, Social Sciences, and Natural Sciences were examined. Non-education subject matter data were analysed using a

Pearson Correlation Coefficient. Results for the number of courses completed, and their relationship to first-year teacher proficiency, are highlighted in Table 3.

Table 3

Relationship of Number of Subject Matter Courses Completed in Required Subject Matter Areas to First-Year Teacher Proficiency

Subject Matter Area	Sample Size	Pearson Correlation Coefficient
Number of Language/Literature Courses Completed	40	.113
Number Mathematics Courses Completed	40	-.115
Number Social Sciences Courses Completed	39	.452(**)
Number Natural Sciences Courses Completed	40	-.110

** Correlation is significant at the 0.01 level

Hypothesis number one was confirmed. The findings reveal that the number of Social Science courses completed is positively related to first-year teacher proficiency. This correlation is in the moderate effect size range according to Cohen (1992). Cohen states that correlations in the 0.1 range are small, 0.3 range are moderate, and 0.5 range are large. The correlation between the number of Social Science courses and first- year teacher proficiency is significant at the 0.01 level. It is important to note that the square of the correlation coefficient is the percentage of variation accounted for in first-year teacher proficiency. Therefore, the number of Social Science courses taken by teachers accounts for 20.4% of the variation in teacher proficiency. As a result, the number of Social Science courses taken by a teacher was included in the Discriminant Function Analysis.

While the number of Language/Literature courses is positively related to first-year teacher proficiency, and the number of Mathematics and Natural Science courses is negatively correlated to first-year teacher proficiency, all three were not statistically significant. Therefore, these variables were not included in the Discriminant Function Analysis.

H2: When examining non-education subject matter courses, it is predicted that grade point averages, in all subject areas, will be positively related to first-year elementary teacher proficiency.

The grade point averages received in the subject matter areas of Language/Literature, Mathematics, Social Sciences, and Natural Sciences were analysed to determine if there was a statistically significant relationship to first-year teacher proficiency. Results are reported in Table 4.

Table 4

Relationship of Overall Grade Point Average in Subject Matter Areas to First-Year Teacher Proficiency

Subject Matter Area	Sample Size	Pearson Correlation Coefficient
Overall Language/Literature Grade Point Average	39	.457(**)
Overall Mathematics Grade Point Average	32	.387(*)
Overall Social Sciences Grade Point Average	37	.138
Overall Natural Sciences Grade Point Average	33	.389(*)

* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

The results confirm hypothesis number two. The findings reveal that the overall grade point averages, in all of the subject matter areas, were positively related to first-year teacher proficiency. However, the only subject matter area that the data indicated had statistical significance, at the 0.01 level, was the overall Language/Literature GPA, and at the 0.05 level, the overall Mathematics GPA and Natural Sciences GPA. These correlations are all in the moderate effect size range (Cohen, 1992). Therefore, when examining overall grade point averages, the Language/Literature GPA accounts for 20.8 % of the variation in teacher proficiency, the Natural Sciences GPA accounts for 15.1 % of the variation and the Mathematics GPA accounts for 14.9 % of the variation. As a result, these three variables were included in the Discriminant Function Analysis.

Education/Methodology Courses

H3: When examining required education courses, it is predicted that final grade point average received in all of the required education courses will be positively related to first-year elementary teacher proficiency.

In this section, the final grade point averages received in the required education/methodology courses were analysed to determine if there were any statistically significant relationships to first-year teacher proficiency. Data were analysed using Pearson Correlation Coefficients. The results are highlighted in Table 5.

Table 5

Relationship of Grade Point Average in Required Education/Methodology Courses to First-Year Teacher Proficiency

Required Education/Methodology courses	Sample Size	Pearson Correlation Coefficient
Education Elementary Introduction to Teaching	40	.252
Education Elementary Reading	39	.345(*)
Education Elementary Mathematics	39	.414(**)
Education Elementary Science	38	.234
Education Elementary Social Studies	39	.207
Overall GPA for Core Methods (L.A., Social Studies, Science, Math)	39	.408(**)
Educational Psychology Introduction to Teaching	39	.131
Educational Psychology Inclusive Education	29	.130
Educational Psychology Educational Assessment	40	.400(*)
Education Policy Studies Managing Learning Environment	31	.115
Education Policy Studies Ethics and Law	31	-.023
EDIT Computer course	33	.220

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Eleven education/methodology courses were analysed. Results of the data analysis confirmed hypothesis number three. Grade point averages in all of the required education courses were positively correlated to teacher proficiency, except for the grade point average in Education Policy Studies – Ethics and the Law. While higher grade point averages were related to first-year teacher proficiency, the only education/methodology courses that showed statistical significance at a 0.01 level were the grade point average in the required Mathematics Methodology course and the grade point average in the required Core Methodology courses. The courses that had significance at a 0.05 level were the grade point average in the required Reading Methodology course and whether the participant had completed the Educational Psychology Assessment Course.

It is important to note that the overall grade point average from the required Core Methodology Courses was statistically significant. However, it was removed from consideration for use in the Discriminant Function Analysis because the Core Methodology course included the required GPA in the Mathematics and Reading courses (which also were statistically significant). To include the Core methodology course would violate the assumption of independence.

In addition, for replication purposes, it is important to report that missing data were an issue for the grade point average obtained in the Educational Psychology Assessment course. Many subjects had not completed this course and, thus, a grade point average could not be reported. This variable was recoded into a dichotomous variable, which classified subjects as to whether or not they had completed the Educational Psychology Assessment course.

The GPA in the required Mathematics Methodology course, the GPA in the required Reading Methodology course, and the completion of the required Educational Psychology Assessment Course, were all in the medium effect size range (Cohen, 1992).

All three variables were, therefore, included in the Discriminant Function Analysis.

H4: When examining optional education courses, it is predicted that the number of Education/Methodology courses and the number of Educational Psychology courses successfully completed, will be positively related to first-year elementary teacher proficiency.

H5: When examining optional education courses, it is predicted that overall grade point averages in Educational Psychology courses and Reading Methods courses will be positively related to first-year elementary teacher proficiency.

While there are required education courses that elementary education students must take, there are also a number of education courses that students can choose to take. The number of overall Education courses completed, the number of Reading Methodology courses completed, the number of Educational Psychology courses completed, and the overall grade point averages received in these areas, were examined to determine if relationships existed between the variables and first-year teacher proficiency. Data were analysed using Pearson Correlation Coefficients and the results are reported in Table 6.

Table 6

Relationship of Number of Courses Completed and Grade Point Average in Optional Education Courses to First-Year Teacher Proficiency

Optional Education Courses	Sample Size	Pearson Correlation
Number of Education Courses completed	40	.121
Number of Reading Methods courses completed	40	.218
Number of Educational Psychology courses completed	40	.366(*)
Overall GPA in Reading Methods Courses	35	.324
Overall GPA for Educational Psychology Courses	40	.232

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

The results from Table 6 partially confirm hypothesis number four. The results reveal that, while the number of Educational Psychology courses, the number of Reading Methodology courses, and the number of General Education courses are positively correlated to first-year teacher proficiency, the only area in which statistically significant relationships were reported at a 0.05 level was in the number of Educational Psychology Courses completed. This is in the moderate effect size range. Therefore, when examining the completion of optional education courses, the number of Educational Psychology courses completed accounts for 13.4% of the variation in first-year teacher proficiency. As a result, the number of Educational Psychology Courses was included in the Discriminant Function Analysis.

The results reported in Table 6 do not support hypothesis number five. While the overall grade point averages in the Educational Psychology courses and Reading Methodology courses were positively correlated to teacher proficiency, neither of the relationships was statistically significant. These variables were not included in the Discriminant Function Analysis.

Overall Grade Point Average

H6: When examining overall university grade point averages, it is predicted that the overall university undergraduate grade point average will be positively related to first-year teacher proficiency.

Overall grade point averages in university undergraduate coursework were examined to determine whether these variables were positively related to first-year teacher proficiency. The overall GPA in the final term of the last year of university and the overall ranking the School Board assigned for the overall undergraduate university grade point average, out of a score of 15, were examined. The findings are reported in Table 7. Data were analysed using Pearson Correlation Coefficients.

Table 7

Overall University Grade Point Average and the Relationship to First-Year Teacher Proficiency

Overall Grade Point Average	Sample Size	Pearson Correlation Coefficient
Final Term of University GPA	40	.395(*)
School Board's Overall Ranking of University GPA	39	.317(*)

5.1-5.3 = **5** 5.4-5.6 = **6** 5.7-5.9 = **7**
6.0-6.2 = **8** 6.3-6.5 = **9** 6.6-6.8 = **10**
6.9-7.1 = **11** 7.2-7.4 = **12** 7.5-7.7 = **13**
7.8-8.0 = **14** 8.1-9.0 = **15**

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

The results from Table 7 confirm hypothesis number six. The overall university grade point average and the final term grade point average were positively correlated to first-year teacher proficiency. The data analysis indicated that both variables showed statistically significant relationships with first-year teacher proficiency. It is important to note that the overall University grade point average encompassed the final term grade point average. Because these two variables are related, only one was chosen to be used in the Discriminant Function Analysis. Therefore, the final term overall grade point average had a higher Pearson Correlation Coefficient and was used in further analyses in this study.

As an additional observational piece of information, when examining the last session transcript results, it was noted that 11 out of the 20 (55%) of highly proficient first-year teachers had been identified as having honours/first-class standing or graduated with distinction. This compares with two out of 20 (8%) from the least proficient first-year teacher group. These results further substantiate the relationship between the last session university grade point average and first-year teacher proficiency.

Practicum Evaluations

H7: When examining student-teaching practicum evaluations, it is predicted that the evaluations will not be related to first-year elementary teacher proficiency.

Practicum evaluations were examined to determine if they were positively related to first-year teacher proficiency. The School Board conducts the screening and hiring of potential teaching candidates. Trained staffing consultants read through the practicum evaluations and assign a score from one to five; with one being the lowest. This number is then multiplied by six to get a total score out of 30. The findings from the examination of the School Board's scoring of practicum evaluations are reported in Table 8.

Table 8

Practicum Evaluation and the Relationship to First-Year Teacher Proficiency

Student-teaching Practicum Evaluations	Sample Size	Pearson Correlation Coefficient
School boards ranking out of score of 30	38	.454(**)

**Correlation is significant at the 0.01 level

When the School Board's ranking of practicum evaluations was examined, hypothesis number seven was not confirmed. Practicum Evaluations were positively correlated, in the moderate effect size range, with first-year teacher proficiency. This variable was statistically significant at a 0.01 level and accounted for 20.6% of the variation in first-year teacher proficiency. The School Board's ranking of the student-teaching practicum evaluations was included in the Discriminant Function Analysis.

Screening and Hiring Prospective Teaching Candidates

H8: When examining the quantitative numbers assigned by the School Board during the screening and hiring of new applicants, it is predicted that the information gathered from application packages and interviews will be positively related to first-year elementary teacher proficiency but letters of reference will not.

The School Board in this study gathered information on teacher applicants in the following areas: overall grade point averages, student-teaching evaluations, the variation of university coursework completed, résumé/letters of reference/biographical information, the interview, and the overall ranking from all of the information examined. Results for these data are highlighted in Table 9. Data were analysed using Pearson Correlation Coefficients. The overall university grade point average and the student-teaching evaluations are not included as they have been analysed and reported in previous sections.

Table 9

School Board's Screening and Hiring Information and Its Relationship to First-Year Teacher Proficiency

School Board's Screening and Hiring Information	Sample Size	Pearson Correlation Coefficient
Ranking of coursework variation out of score of 5	38	.052
Ranking of résumé/letters of reference/biographical information out of score of 10	39	.009
Interview total score out of score of 40	40	.366(*)
Ranking of interview: attitude component out of score of 10	38	.261
Ranking of interview: personal qualities out of score of 10	38	.331(*)
Final overall screening and hiring score out of score of 100	39	.423(**)

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

The results from Table 9 indicate that the ranking of coursework variation and the résumé/letter of reference/biographical information had almost no relationship to first-year teacher proficiency. The only variable that had statistical significance at the 0.01 level was the final overall screening and hiring total score and, at the 0.05 level, the interview total score and the personal qualities score from the interview. These variables were in the moderate effect size range.

It is important to note that the personal qualities score from the interview and the final overall screening and hiring score, while statistically significant, were removed from consideration for use in the Discriminant Function Analysis. This was done because the personal qualities score was a subset of the total interview score. The final overall screening and hiring score included the interview total score. To include these variables would violate the assumption of independence. As a result of examining the School Board's screening and hiring information, the interview total score, which accounted for 13.4% of the variation in first-year teacher proficiency, was the only variable considered for inclusion in the Discriminant Function Analysis.

Pearson Correlation Coefficient Analysis –Summary of Results

As a summary for this section, all of the independent variables that had a statistically significant relationship to first-year teacher proficiency, met the linear model assumptions, and were included in the Discriminant Function Analysis, are highlighted in order of significance, in Table 10.

Table 10

Variables That Have a Statistically Significant Relationship to First-year Teacher Proficiency

Statistically Significant Variables		Highly Proficient First-Year Teachers			Least Proficient First-Year Teachers		
Independent Variable	Pearson Correlation	Mean	Std Error	Std Deviation	Mean	Std Error	Std Deviation
Lang/Lit GPA	.457(**)	6.842	.2193	.9559	5.956	.1813	.8108
Practicum Evaluation	.454(**)	25.21	.1806	.7873	24.31	.2301	1.0029
# Social Science Courses	.452(**)	5.368	.7383	3.218	2.700	.4707	2.1051
Required Math Methods GPA	.414(**)	7.250	.1902	.8507	6.421	.2334	1.0174
Assessment Course	.400(*)	.8500	8.192E	.3663	.6000	.1124	.5026
Final Term GPA	.395(*)	7.405	.1408	.6295	6.875	.1423	.6365
Natural Science GPA	.389(*)	6.194	.2667	1.0997	5.268	.2909	1.1637

Mathematics GPA	.387(*)	6.800	.2960	1.1464	5.747	.3414	1.4076
# Ed Psy Courses	.366(*)	4.950	.6508	2.910	3.250	.2603	1.1642
Interview Total Score	.366(*)	34.90	.5799	2.5935	33.05	.4946	2.211
Reading Methods GPA	.345(*)	7.200	.2471	1.1050	6.473	.2076	.9048

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Discriminant Function Analysis

H9: When all of the variables that have statistically significant relationships to first-year elementary teacher proficiency are used in Discriminant Function Analysis, the equation will predict successful membership into the highly proficient first-year teacher group or least proficient first-year teacher group 65% of the time or more.

Discriminant Function Analysis is a statistical technique in which variables, or attributes, are examined to see if they discriminate between two or more groups. In this study there were two groups being researched, high proficient first-year teachers (coded as 1) and least proficient first-year teachers (coded as 0). This teacher proficiency group variable, referred to herein as the dependent variable, is what is being predicted or explained (i.e., group membership is being predicted/explained) by the Discriminant Function Analysis. Information regarding each teacher in this study is referred to as the independent variables (i.e., predictor variables), consisting of attributes such as teacher grades in a number of university courses, number of courses taken, teacher practicum ratings, and so on. The Discriminant Function Analysis, within this study, endeavoured to determine which set of independent or predictor variables best predict teacher group membership as a proficient or non-proficient first-year teacher.

The 11 independent variables, previously identified as being included in the Discriminant Function Analysis, were analyzed. All 11 independent variables were entered together into the Discriminant Function Analysis (as apposed to a stepwise method). These 11 variables encompass the one canonical discriminant function that described first-year teacher proficiency group membership. The canonical discriminant function is a linear combination of all 11 independent variables, which describes group membership. A description of a general discriminant function equation is listed in Figure 1.

Figure 1

A General Discriminant Function Equation

$$DF = c + b_1x_1 + b_2x_2 + \ldots + b_nx_n$$

Where b-values are the discriminant function coefficients (unstandardized), x-values are the raw (nonstandardized) values of each independent variable included in the analysis, and the c-value is a constant. The b-values and constant are obtained as part of a Discriminant Function Analysis. Results of the Discriminant Function Analysis for the current study are listed in Tables 11 and 12.

Table 11

Summary of Canonical Discriminant Function Analysis Results for First-Year Teacher Proficiency Groups

1 DISCRIMINANT FUNCTION ANALYSIS Function		Test of function			
Eigenvalue	Canonical correlation	Wilks' Lambda	Chi-square	df	Significance
2.448	0.843	0.290	25.376	11	0.008

Table 11 presents the summary results for the Discriminant Function Analysis. The eigenvalue is a measure of the discriminating power of the discriminant function. In Discriminant Function Analyses with more than one discriminant function (e.g., with 3 or more groups), the eigenvalue is an indicator of the relative explanatory importance between different discriminant functions. In this study there are two groups (highly proficient and least proficient first-year teachers), therefore only one discriminant function, and therefore only one eigenvalue. The canonical correlation describes the correlation between the discriminant function and the independent variables. A high canonical correlation, as we see in this case, illustrates that a large amount of variation in the independent variables is expressed by the discriminant function. Wilks' Lambda is a statistical test, which tests the significance of the overall discriminant function (i.e., is there discrimination between groups). The lower the Wilks' Lambda, the more likely that the discriminant function will be statistically significant (i.e., that there is statistically significant discrimination between groups). In this case, the Wilks' Lambda was found to be 0.290, which is significant at 0.008, according to the Chi-square significance test. Overall, Table 11 describes a statistically significant Discriminant Function Analysis in which the independent (predictor) variables, as a whole, differentiate well between proficient and non-proficient teacher groups.

Table 12

Detailed Canonical Discriminant Function Analysis Results for First-Year Teacher Proficiency Groups

Independent variables	Wilks' Lambda	F (significance)	Standardized canonical discriminant function coefficients	Unstandardized canonical discriminant function coefficients (Constant = -16.478)
Reading Methods GPA	0.950	1.358 (0.254)	-0.582	-0.513
Math Methods GPA	0.793	6.777 (0.015)	0.991	0.975
Took EDPSYCH assessment course	0.872	3.824 (0.061)	-0.428	-0.885
Number of EDPSYCH courses taken	0.917	2.358 (0.137)	-0.098	-0.047
Final Term GPA	0.842	4.864 (0.036)	-1.119	-1.674

Overall GPA in language/literature Courses	0.660	13.367 (0.001)	0.737	0.972
Overall GPA in math courses	0.707	10.792 (0.003)	0.632	0.536
Number of social science courses taken	0.849	4.616 (0.041)	1.216	0.512
Overall GPA in natural science courses	0.788	7.010 (0.014)	0.501	0.468
School Board Practicum Eval	0.846	4.724 (0.039)	0.639	0.668
School board interview ranking	0.920	2.259 (0.145)	-0.376	-0.150

Table 12 provides detailed information regarding each independent variable and its relative importance and relationship to the discriminant function, which defines first-year teacher proficiency group membership. In Table 12, Wilks' Lambda tests the equality of group means and therefore describes the degree to which each independent variable differentiates between the first-year teacher proficiency groups. The lower the Wilks' Lambda the greater the mean difference between groups and, therefore, the more the independent variable contributes to the discriminant function. The lower the Wilks'

Lambda the higher the F statistic and, therefore, the lower the statistical significance (i.e., the more statistically significant the contribution of the independent variable to the discriminant function). We can see that the independent variable, "Overall GPA in language/literature courses," has the lowest Wilks' lambda and therefore contributes the most to the discrimination between teacher proficiency groups. The independent variable "Reading methods," which is the teacher achieved grade in the required reading methodology course, contributes the least to the discrimination between teacher proficiency groups. The standardized canonical discriminant function coefficients are similar to beta weights in multiple linear regression analyses and describe the relative contribution of the independent variables to the discriminant function and, therefore, to the explanation of group membership. The unstandardized canonical discriminant function coefficients are simply the unstandardized weights (weights used in conjunction with the raw independent variable values) of the discriminant function.

The information in Table 12 allows for the construction of a predictive Discriminant Function Analysis equation. Using the general equation shown in Figure 1, and by entering the unstandardized canonical discriminant function coefficients and constant from Table 12, the predictive discriminant function equation listed in Figure 2 is produced. By entering information regarding each teacher into the equation, a discriminant score is produced for each subject. Because the least proficient first-year teacher group was coded as zero, discriminant scores less than zero are an indication that the teacher may be classified into the unsuccessful teacher group. In similar manner, because the highly proficient first-year teacher group was coded as one, discriminant scores greater than zero are an indication that the teacher may be classified into the least proficient teacher group. The greater the absolute value of the discriminant score the more likely that the teacher belongs in one group or the other (e.g., a discriminant score of +2 would show a much higher likelihood of belonging to the proficient teacher group than a discriminant score of +0.5; in similar manner a discriminant score of -2 would show a much higher likelihood of belonging to the least proficient teacher group than a discriminant score of -0.5).

Figure 2

Discriminant function equation to predict teacher proficiency group membership

Teacher proficiency = -16.478 + (-0.513*GPA in Required Reading Methods) + (0.975*GPA in Required Math Methods) + (-0.885* Completed EdPsy Assessment Course) + (-0.047*# of EdPsy courses) + (-1.674*last session GPA) + (0.972*Lang/lit GPA) + (0.536*Math GPA) + (0.512*# of Social Science Courses) + (0.468*Natural Science GPA) + (0.668*School Board Practicum Rating) + (-0.150*Interview Total Score).

To determine how well the discriminant function equation performed in assigning group membership, the equation listed in Figure 2 was used to calculate discriminant scores for all teachers in the data set. Cases in which there was missing information for one or more of the independent variables were excluded from the analysis. As a result, 12 cases were excluded from the discriminant score calculation analysis. Of the 28 remaining cases (14 cases in each group), based on the discriminant scores, group membership was assigned either to the least proficient first-year teacher group or to the highly proficient first-year teacher group. Therefore, any cases with discriminant scores less than zero were classified into the least proficient teacher category, and any cases with discriminant scores greater than zero were classified into the proficient teacher category.

To assign a probability of group membership based on the discriminant score, the discriminant scores computed by SPSS during the Discriminant Function Analysis were compared to the probability of least proficient group membership computed by SPSS. A robust logarithmic relationship was found (using the curve estimation function within SPSS) between the two factors (see Figure 3). As a result, a probability of group membership logarithmic equation was developed, based on the logarithm weights obtained via the SPSS curve estimation procedure, shown in Figure 4. This equation is the basis for the values shown in the "Probability of least proficiency group membership" column.

Figure 3

SPSS produced discriminant scores and probabilities of group membership

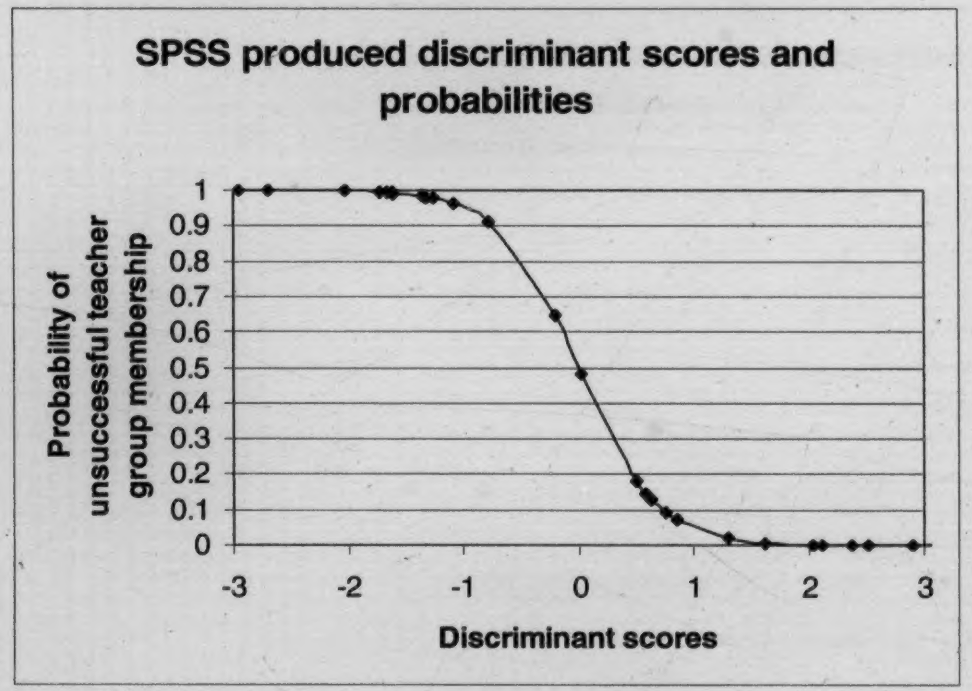

Figure 4

Probability of least proficiency group membership logarithm equation

$$\text{Probability} = \frac{1}{\left(\dfrac{1}{1+\left(1\times 20.4004^{DS}\right)}\right)}$$

Where *DS* is the discriminant score of the case in question.

The results of this analysis are presented in Table 13.

Table 13

Results of the discriminant score calculation and predicted teacher proficiency group membership

Case number	Discriminant score	Probability of least proficient group membership	Actual group	Discrimimant Functional Analysis predicted group	Proficient group assignment
1	-1.37140	.98366	non-proficient	non-proficient	Yes
2	-2.03340	.99775	non-proficient	non-proficient	Yes
3	-1.73760	.99456	non-proficient	non-proficient	Yes
4	-1.32584	.98126	non-proficient	non-proficient	Yes
5	-1.61460	.99209	non-proficient	non-proficient	Yes
6	-.78980	.91231	non-proficient	non-proficient	Yes
7	-1.09760	.96371	non-proficient	non-proficient	Yes
8	-1.62620	.99238	non-proficient	non-proficient	Yes
9	.57400	.14617	non-proficient	proficient	No
10	-2.70960	.99971	non-proficient	non-proficient	Yes
11	-1.67280	.99337	non-proficient	non-proficient	Yes
12	-2.96680	.99987	non-proficient	non-proficient	Yes
13	-1.62540	.99235	non-proficient	non-proficient	Yes
14	-1.27480	.97831	non-proficient	non-proficient	Yes
15	2.89180	.00016	proficient	proficient	Yes

16	2.36500	.00077	proficient	proficient	Yes
17	.74340	.09342	proficient	proficient	Yes
18	-.01400	.47941	proficient	proficient	Yes
19	.84480	.07006	proficient	proficient	Yes
20	1.29020	.01933	proficient	proficient	Yes
21	2.10380	.00170	proficient	proficient	Yes
22	1.61680	.00736	proficient	proficient	Yes
23	3.63580	.00002	proficient	proficient	Yes
24	.48960	.18052	proficient	proficient	Yes
25	2.02780	.00213	proficient	proficient	Yes
26	2.51300	.00049	proficient	proficient	Yes
27	-.21260	.64706	proficient	non-proficient	No
28	.62180	.12867	proficient	proficient	Yes

The results of the discriminant score calculation and predicted teacher proficiency group membership presented in Table 13 show that 92.9% of cases, or 26 of 28 cases, were correctly classified into either the least proficient teacher group or the highly proficient teacher group on the basis for the discriminant scores for each case. One case was misclassified into the least proficient group and one case was misclassified into the highly proficient group. The probability of least proficient group membership calculated for each case show that those misclassified cases were borderline cases in which the probability of group membership into the predicted group, based on the discriminant score, was low (e.g., case 9 was misclassified into the non-proficient group based on the discriminant score of 0.57400, which showed a low likelihood via the probability of 0.14617, or 14.6%, that case 9 actually belonged in that group). In an actual implementation of these Discriminant Function Analysis results, the probability of group membership would likely be used as part of the decision making process for assigning cases into groups, rather than simply assigning group membership based on whether or not the discriminant score for a case is positive or negative.

Chapter V

Discussion of Findings

The purpose of this research study was to examine 32 common pre-service variables found in elementary teachers' personnel files to determine which, if any, of these variables could successfully predict first-year teacher proficiency. In order to evaluate the relationship of each independent pre-service variable with first-year teacher proficiency, Pearson Correlation Coefficients were generated to determine the magnitude and statistical significance of the relationship between variables.

Of the 32 independent variables, 11 showed a significant relationship to first-year teacher proficiency. These 11 variables were selected for inclusion in the Discriminant Function Analysis. It was hypothesized that these 11 variables would form the most explanatory group of attributes to discriminate between highly proficient and least proficient first-year teachers. The disciminant function analysis statistical procedure was used to develop an equation, to classify and predict membership into either the highly proficient first-year teacher group or the least proficient first-year teacher group. The results of the discriminant score calculation, predicted first-year teacher proficiency 92.9% of the time.

The organization of this chapter will begin with a discussion of the results from the Pearson Correlation Coefficients. The 32 variables examined fell under five categories: Subject Matter Courses, Education/Methodology Courses, Overall University Grade Point Average, Practicum Evaluations, and Screening and Hiring Information. Therefore, the results of the Pearson Correlation Coefficients are discussed under the categories in which the variables were classified.

In addition, the results of this study will be discussed with respect to their relationship to previous research studies highlighted in the literature review. It is important to note that the majority of prior research measured teacher quality/proficiency by gains in student achievement. While this study does not measure teacher proficiency by gains in student achievement, it is assumed by the definition of first-year teacher proficiency, that optimum student learning occurred. In this study, teacher proficiency was measured by the ability to meet the Provincial Teacher Quality Standard, receiving a continuous teaching contract with the School Board, and being nominated to receive an award for excellence in first-year teaching. By definition, meeting the teaching quality standard "occurs when the teacher's ongoing analysis of the context, and the teacher's decisions about which pedagogical knowledge and abilities to apply, result in optimum learning by students" (Alberta Government, 1997, p. 4.2.1). Therefore, it is the belief of this researcher that comparisons between this study and previous research findings can be extrapolated.

This chapter will conclude with a discussion about the results of the Discriminant Function Analysis and the model, which was developed to predict first-year teacher proficiency. Implications of this model, limitations of the study, as well as future research will also be discussed.

Subject Matter Courses

As stated in the literature review, studies have been conducted to determine whether the completion of subject matter courses can be used to discriminate teacher proficiency. Research findings in this area to date have not been strong, nor have the results been consistent (Darling-Hammond, 2002; King, 2002; Shields et al., 2003;

Wenglinsky, 2002). Because subject matter knowledge is not clearly defined, and coursework varies greatly from one university to the next, the impact is not always clear (Wilson, Floden, & Ferrini-Mundy, 2001). Few studies directly link how the type of subject matter courses completed affect first-year teacher proficiency (Edwards, 2005).

Byrne (1983) summarized the results of 30 studies relating teachers' subject matter knowledge to teacher proficiency. The results of Byrne's synthesis of previous empirical work were ambiguous. Seventeen studies showed subject matter knowledge had a positive relationship to teacher proficiency, although not always statistically significant, and 13 studies showed no relationship.

The results of this dissertation were similar to findings in Byrne's synthesis. The findings of the relationship between subject matter knowledge and elementary first-year teacher proficiency varied, depending on the subject matter area being examined. In general, the highly proficient first-year teacher group had completed more Social Sciences and Language/Literature courses, yet fewer Natural Sciences courses and Mathematics courses, than the least proficient first-year teacher group. However, the only finding that had statistical significance was the positive relationship between the number of Social Science courses completed and first-year teacher proficiency. As noted in chapter IV, this correlation was in the moderate effect size range and was significant at the 0.01 level. The number of Social Science courses taken by teachers accounted for 20.4% of the variation in first-year teacher proficiency. Examples of the specific courses that are considered to be Social Science courses are included in Appendix B.

An explanation for why the number of Social Sciences courses completed was positively related to first-year elementary teacher proficiency, is provided in the literature. As noted in chapter II, recent demographic projections indicate that, more likely than ever before, teachers are required to teach children from different ethic backgrounds than their own (Ross & Smith, 1992). As Milner et al. (2003) stated, "The racial, ethnic, socio-economic, cultural, and linguistic orientations of students are more varied now than ever in the past" (p. 63). A report from the Teachers of English to Speakers of Other Languages (1997) indicated that, presently, the majority of the school-aged population is from language minority and marginalized backgrounds.

In response to this increase in diversity, educators must work differently if they are to be proficient (ASCD, 2002). Thus, the relationship between the number of Social Sciences courses and first-year teacher proficiency seems logical. Completing more courses in the Social Science area likely provides first-year teachers with additional background knowledge that relates to the variety of social contexts found in a typical classroom. This knowledge base appears to have a positive effect on first-year teacher proficiency. Therefore, it could be extrapolated that the task of helping pre-service teachers become more aware of multicultural and diversity issues, is critical to first-year teacher proficiency and, thus, an essential component of elementary teacher preparation programs (Milner et al., 2003).

Data from a survey conducted by Utely, Delquadri, Obiakor, and Mims (2000) indicated that approximately 40% of the teachers they surveyed were not provided coursework in teaching multicultural students in their pre-service training. Forty-two percent of respondents indicated that knowledge of multicultural students would be beneficial. This survey highlights the fact that teachers are indicating that more knowledge about teaching diverse populations is required in teacher education programs.

Garmon (2004) reported that to prepare teachers for the increase in diversity found in typical classrooms, a multicultural focus should become a common feature in all teacher education programs.

The results of this study, coupled with findings from previous research suggests that, pre-service elementary teachers would benefit from being required to complete additional subject matter courses in the Social Science area. As reported by the National Council for Accreditation of Teacher Education (1997), the completion of coursework that provides teachers with additional knowledge about cultural, political, and ethical foundations of education, will assist potential teachers in developing their understanding of the complex contexts within which schools are embedded. Such courses could include topics that center on diversity as it is broadly defined, including issues of: race, class, gender, culture, religion, ethnicity, disability, etc. As stated by Milner et al., (2003), "there should be a thematic permeation of the teacher education programs' commitment to diversity" (p 68). North America is growing increasingly diverse. Teacher preparation programs that engage in continuous reform, with respect to offering coursework that reflects the increase in diversity, are at the heart of the teacher quality issue (Wise, 2003). It is important to note, however, that this study only examined the number of Social Science courses that were completed. Further research is required to know which specific Social Science courses contributed to first-year teacher proficiency. Further research in this area would provide university administrators with critical information that could impact on decision making with respect to determining course requirements for teacher education programs.

Other prior research that examined subject matter knowledge and its relationship to teacher proficiency was compared to the results of this dissertation. Monk (1994) collected data on 2 829 secondary students from the Longitudinal Study of American Youth and found that teachers' subject matter knowledge, as measured by coursework in their respective subject fields, was positively related to teacher proficiency in Mathematics and Science. He reported that the more courses the teachers had completed, the better the students achieved. Monk also reported that any more than five courses in a Mathematics and Science major did not have any additional effect on teacher proficiency.

The results of this dissertation do not concur with Monk's findings. In this study, when first-year teachers' subject matter knowledge was examined, it was found that the number of Mathematics and Science courses completed was not positively related to first-year teacher proficiency. In fact, the highly proficient first-year teacher group had completed fewer Mathematics and Science courses than the least proficient first-year teacher group.

While the findings of this dissertation contradict the findings of Monk (1997), they do concur with the findings of Begle (1979). In a study of 112 000 students, conducted through the National Longitudinal Study of Mathematical Abilities, Begle found that measures of teacher subject matter knowledge did not have strong influences on teacher proficiency, as measured by student achievement. Indeed, Begle reported that coursework in Mathematics methodology had a stronger effect on student achievement than higher-level coursework in the subject matter area.

The reason that the findings reported in this dissertation concur with those of Begle, but not those of Monk may be because Monk's study examined secondary teachers while this study examined the proficiency of first-year elementary teachers. Rowan, Correnti, and Miller (2002) reported that subject matter knowledge of elementary teachers does not show significant effects on teacher proficiency, as measured by student achievement. This is because the complexity of the content of the curriculum taught in secondary schools, especially in the areas of Mathematics and Science, is greater than that taught in elementary schools. While advanced coursework may be required to proficiently teach secondary content, the same breadth and depth of subject matter knowledge may not be required for elementary teaching. Parenthetically, this could be why most elementary education programs follow a generalist model

This finding was further substantiated by the National Center for Education Statistics (NCES, 1998). It was reported that fourth-grade students, who were taught by teachers with a minor in Mathematics, did not perform better than students whose teachers did not have a minor in Mathematics. Conversely, eighth-grade students, who were taught by a teacher with a major in Mathematics, outperformed students taught by a teacher without a major in Mathematics. This may suggest that higher competence and familiarity with subject matter knowledge, in the area of Mathematics and Natural Sciences, is required only at levels above elementary grades.

This study not only examined the number of subject matter courses completed, but also the overall grade point averages received in the subject matter areas. This study revealed that, while the overall grade point averages in all of the subject matter areas were positively related to first-year teacher proficiency, the only subject matter area that the data indicated had statistical significance at the 0.01 level, was the overall Language/Literature GPA. The overall Mathematics GPA and the overall Natural

Sciences GPA was statistically significant at the 0.05 level. These correlations were all in the moderate effect size range. The fact that the overall GPA in Language/Literature, Mathematics, and Natural Sciences, were statistically and significantly related to first-year teacher proficiency suggests that a basic level of mastery in these subject matter areas is more important than additional subject matter courses taken over and above the mandated requirements.

A possible explanation for why a higher overall grade point average in the area of Language/Literature was related to first-year teacher proficiency may be because a major priority in elementary school is proficiency in teaching children to read. Such being the case, a higher GPA in the area of Language/Literature might suggest a more thorough understanding of basic language concepts and could imply a higher literacy level than a lower GPA. These two factors may account for the positive relationship to first-year teacher proficiency. This idea is supported by Hanushek (1971), who found that teachers who were highly literate, as measured by scores on tests of verbal and written ability, improved student achievement 0.2 to 0.4 grade levels more than teachers who were the least literate. In addition, a recent study of National Board teachers in North Carolina found that the teacher attribute that most consistently produced higher achievement gains was the literacy level of teachers (Goldhaber & Anthony, 2004).

A possible explanation for why a higher overall grade point average in the area of Mathematics and Natural Science was related to first-year teacher proficiency may be due to the fact that being successful in Mathematics and Natural Science coursework often requires an ability to problem solve, reason, and think critically. As highlighted by the National Board for Professional Teaching Standards (1989), proficient teachers expose their students to different modes of critical thinking and teach their students to think analytically about content. Thus, it could be assumed that first-year teachers who demonstrate basic academic proficiency in the areas of Mathematics and Natural Sciences possess greater ability to problem solve, reason, and think critically. As a result, they are better able to help their students develop these skills. Literature in the field supports the notion that all teachers, regardless of the ages of their students, must possess the ability to help their students develop critical thinking skills, problem solving, and reasoning ability. However, further research is necessary to establish the veracity of this assumption.

In summary, as in most previous studies, the research findings in the area of subject matter knowledge and first-year teacher proficiency are mixed. Some areas of subject matter knowledge appear to be related to first-year teacher proficiency while others do not. This study revealed that the number of Social Sciences courses completed and the overall grade point average in Language/Literature, Mathematics and Natural Science courses were positively and significantly related to first-year teacher proficiency. Thus, these four variables were included in the Discriminant Function Analysis for the development of a predictive model.

Education/Methodology Courses

The most proficient teachers not only have adequate preparation in their subject matter, they also have studied the art and science of teaching (Darling-Hammond, 2002; Rice, 2003). In general, researchers have reported that teachers with greater preparation in teaching methodology have been found to be more proficient than those with less preparation (Darling-Hammond, 2000; Darling-Hammond & Berry, 1998; Laczko-Kerr & Berliner, 2002; Riggs & Riggs, 1991).

The findings of this dissertation support the contention that teacher education coursework has a positive relationship to first-year teacher proficiency. The results revealed that the number of Reading Methodology courses, the number of General Education/Methodology courses, and the number of Educational Psychology courses completed, were all positively related to first year teacher proficiency. However, the only area in which statistically significant relationships were reported at a 0.05 level, or a moderate effect size range, was in the number of Educational Psychology courses completed. Examples of specific Educational Psychology courses are included in Appendix C and include courses in child development and adapting instruction to meet the needs of exceptional learners.

That the number of Educational Psychology courses completed was positively related to first-year teacher proficiency, is consistent with prior research findings. Saether (1999) supported the contention that Educational Psychology courses should be embedded in teacher education programs. He reported that learning and developmental theories should be applied in a discussion of real life situations, to assist teachers in seeing the relationship between teaching practice and Educational Psychology theory.

In reviewing the most recent literature regarding the specific types of university courses which may have positive effects on teaching performance, the importance of completing Educational Psychology courses, which focus on how teachers can meet the multiple learning needs of the current student population, is highlighted. In today's classrooms, there are an increasing number of students with a wide range of academic and physical abilities. Students with physical, emotional, and cognitive disabilities are being educated in the regular classroom (Lupart, McKeough, & Yewchuk, 1996). Thus, it is logical that the completion of additional coursework in the area of Educational Psychology, specifically in relation to special education coursework, would have a positive relationship to first-year teacher proficiency. This is confirmed by Wenglinsky (1996), who reported that students whose teachers had knowledge about how to work with students from different cultures and with different special needs tested more than one full grade level above their peers.

The importance of completing Educational Psychology courses, with a special education focus, is further supported by Woloshyn, Bennett, and Berrill (2003). They conducted focus group sessions with 91 teacher candidates from six faculties of education in Ontario. These teacher candidates expressed concerns about their ability to identify, assess, and program for children with learning disabilities and highlighted the need for greater emphasis, throughout the pre-service program, on course content that focused on how to work with students with differing developmental needs.

A report titled, "Where We Stand on Teacher Quality" (ETS, 2004), also highlighted the importance of such Educational Psychology coursework on teacher proficiency. This report highlighted that proficient teachers should possess both generic and content specific knowledge in the areas of child development, child management, motivating children to learn, interpreting and using assessment data, individualizing instruction, working with children with disabilities, and working with children from other cultures, all of which are components of Educational Psychology coursework.

Such being the case, what implications does this have for pre-service teachers and teacher preparation programs? All new teachers entering the profession need to understand clearly that inclusion of special needs students and students from culturally diverse backgrounds, is a reality in today's schools. To assume that any teacher will only teach "regular" students, all functioning at the same level, is unrealistic. Today, nearly 96% of students are served in a regular school setting (Garmon, 2004). To assume that only those teachers who plan to teach in a segregated setting will benefit from Educational Psychology courses is erroneous. All education students, regardless of whether they follow an elementary or secondary route, require a foundation in Educational Psychology/Special Education. If new teachers enter the teaching profession believing that they have no responsibility for educating diverse or special needs students, they will be unprepared emotionally and academically for the demands of being a teacher, and will likely be minimally proficient as teachers. This will result in performance difficulties. Educational Psychology courses that focus on meeting a range of learning needs in academic, behavioural, and social emotional areas are essential. With this in mind, one could assume that completing Educational Psychology courses that focus on inclusion of special needs in the regular classroom, language acquisition with a focus on teaching of a second language, classroom management with a focus on strategies that reflect cultural, emotional and socio-economic factors, and instructional strategies that focus on meeting a range of needs, would have a positive effect on teaching performance. However, further research into the specific types of Educational Psychology courses which most significantly relate to first-year teacher proficiency, is required.

This dissertation not only examined the number of education/methodology courses completed and their relationship to first -year teacher proficiency, but also the overall grade point averages received in the education/methodology courses. In all of the required education/methodology courses, grade point averages were positively related to first-year teacher proficiency. However, the only relationships that were statistically significant were for the required Mathematics Methodology course and the required Reading Methodology course.

That the grade point average in the required Mathematics Methodology course was positively related to first-year teacher proficiency is supported by previous research. Monk and King (1994) reported that, in the area of Mathematics, teacher methodology courses were more influential than extra subject matter classes. It was the pedagogical knowledge of how to teach mathematics that had the most influence on teacher proficiency.

That the GPA in the required Reading Methodology course was positively related to first-year teacher proficiency was also supported by previous research. The findings of Riggs and Riggs (1991) indicated that grades obtained in Reading methodology courses produced consistent and significant correlations with student-teaching proficiency. This notion is also supported by Hoffman, Roller, Maloch, and Sailors (2005). They focused on the reading preparation of elementary pre-service teachers and its effects on the first three years of teaching. Evidence gathered from this study suggested that teacher preparation programs, which focused on the critical importance of teaching reading, had a positive influence on teaching quality. In fact, the performance of these teachers compared favourably with the performance of experienced teachers, nominated as excellent by principals.

An additional explanation for why the highly proficient first-year teacher group received higher grade point averages in the required Reading and Mathematics methodology courses may be due to the fact that much of the elementary school curriculum focuses on Language Arts and Mathematics. As a result, pedagogical competence in these core areas may be critical to the proficiency of an elementary teacher. It seems logical that teachers need to have good knowledge of how readers form concepts/schemata, interact with text, and make sense of new information, words and ideas. It is also important that teachers have knowledge of how students develop mathematical reasoning and construct number concepts. In addition, the School Board involved in this study identified improvement in literacy and numeracy as one of its priorities. A goal of this School Board is to have all elementary students meeting the Language Arts and Mathematics curriculum standards by grade 3. Thus, it is not surprising that teachers, who have higher grade point averages in the required methodology courses in Reading and Mathematics, were more proficient in their first-year of teaching than those with lower grade point averages in Reading and Mathematics Methodology.

The findings of this dissertation also revealed that the completion of an Educational Psychology Assessment Course was positively related to first-year teacher proficiency. This was statistically significant at the 0.05 level with an effect size of 0.4. These results are consistent with previous research conducted by Black and William (1998) who reported that the relationship of assessment knowledge to teacher proficiency, as measured by student achievement, fell in the effect size range of 0.4 to 0.7. This is considered to be a medium to large effect size range.

One of the reasons that knowledge of assessment strategies may be positively related to first-year teacher proficiency may be because the role of assessment, as a means of determining what a student knows, and then using the results of the assessment to inform teaching practice, is essential to the success of all learners (Hughes, 1999; Leitzel & Vogel, 1994; Stiggins, 1997). Research shows that teachers who use assessment data to guide and improve their teaching, are more proficient than teachers who do not (USDE, 2005). This is supported by Black and William (1998), who reported that there is evidence that formative assessments are an essential component of proficient instruction and improved student achievement. Teachers need to know about their students' progress and the difficulties students experience in their learning, in order to be able to adapt their instruction to meet individual student needs (USDE, 2005). An ability to assess individual student needs is especially critical, in light of many research findings concerning the increasing diversity and range of student learning needs in typical classrooms today. This is substantiated by Fuchs and Fuchs (1986), who reported that formative assessments are particularly useful in raising the performance of low achievers.

What impact does the knowledge that completing an Educational Psychology Assessment course is positively related to first year teacher proficiency have on teacher education programs? Findings of this research study suggest that proficient first-year teaching requires specific knowledge and skills in assessment. Therefore, it is critical, that the components of effective assessment, which are outlined below, be woven into undergraduate assessment courses (Chappuis, Stiggins, Arter, & Chappuis, 2003).

- Teachers must have a clear understanding of curriculum to determine what needs to be assessed.
- Teachers must understand the full range of the different forms of assessment (observation of process, product, contextualized and de-contextualized measures) and have a clear understanding of their purposes.
- Teachers must be able to build sound assessments that match targets and track student achievement.
- Teachers must use assessment evidence to make conclusions about what has been learned and what curriculum standards need to be reinforced. This directly links to being able to determine which teaching strategy will best enable the learning to take place.
- Teachers must understand sources of bias and be able to preclude bias from assessment.
- Teachers need to understand how to involve students in their own assessment in order to maximize student achievement and motivation.

In summary, as is the case in previous studies, the research findings in the area of education/methodology courses and first-year teacher proficiency are mixed. Some areas of education coursework appear to be related to first-year teacher proficiency while others do not. This study revealed that the number of Educational Psychology courses completed, the final grade point average in the required Reading and Mathematics methodology courses, and whether the teaching candidate had completed an Educational Psychology Assessment course, were positively and significantly related to first-year teacher proficiency. Thus, these four variables were included in the Discriminant

Function Analysis, for the development of a predictive model. These findings also suggest that teacher preparation programs should continue to refine the courses they offer in the area of Educational Psychology, Reading and Mathematics. If these coursework areas relate to first-year teaching proficiency, it is critical that universities compare the programs they offer, in relation to the literature on what constitutes excellence in reading instruction, mathematics instruction, assessment instruction, and programming to meet a range of needs.

Overall Grade Point Average in University

Previous research into whether overall grade point averages in university coursework can be used to discriminate teacher proficiency is limited. Most of the literature examined verbal ability and/or cognitive ability and their relationship to teacher proficiency. The few studies that examined overall pre-service teachers' academic ability and its relationship to teacher proficiency, consistently show a positive relationship between the two (Strauss & Vogt, 2001).

Dobry, Murphy, and Schmidt (1985) compared education students' overall grade point averages to their student-teaching evaluations. While the two were positively related, the relationship was not statistically significant. Schalock (1979) and Soar, Medley, and Coker (1983) reviewed a number of studies dating as far back as the 1940s that examined the relationship of general academic ability to teacher proficiency, as measured by student achievement. They, too, found that, while the studies consistently showed a positive correlation between teachers' academic ability and teacher proficiency, most relationships were small and statistically insignificant.

Guyton and Farokhi (1987) examined the relationship between academic performance and teaching success in a sample of over 400 graduates of a university teacher education program. The results showed that teachers' grade point average was positively correlated with teacher proficiency, as measured by a performance-based assessment, required for continuing state certification.

This dissertation examined the overall grade point average in the final term of university, as well as the ranking of the overall grade point average, assigned by the School Board when they were screening potential teaching candidates. The results indicated that the overall university grade point average and the final term grade point average were positively correlated to first-year teacher proficiency. The data analysis indicated that both variables showed statistically significant relationships with first-year teacher proficiency. It is important to note that the overall University grade point average encompassed the last term grade point average. Because these two variables were related, only one was chosen to be used in the Discriminant Function Analysis. The final term grade point average was used in the Discriminant Function Analysis, because the Pearson Correlation Coefficient was higher. The final term grade point average accounted for 15.6 % of the variance in first-year teacher proficiency. In addition, it was noted that 11 out of the 20 (55%) highly proficient first-year teachers had been identified as having honours/first class standing in the last session of their teacher education program. This compared with two out of 20 (8%) from the least proficient first-year teacher group.

While some educators have questioned the premise that high grades and proficient first-year teaching are related (Rice, 2003), the results of this study confirm that the final term grade point average is positively related to first-year teacher proficiency. This may be because, in the final term of university, pre-service teachers have completed the majority of their education coursework. It may be that, at this point in time, their marks are a reliable measure of the knowledge they have acquired and a valid predictor of first-year teacher proficiency. It is during this final term that pre-service teachers can demonstrate, most effectively, their mastery of their program and their true knowledge and learning in the area of teaching.

Practicum Evaluations

The review of literature in the area of practicum evaluations indicates that, as a whole, practicum evaluations of student-teaching do not provide accurate and reliable discrimination of teacher proficiency (Brucklacher, 1998; Guyton & McIntyre, 1990; Katz & Raths, 1992; Knowles, 1992; Raths & Lyman, 2003). As a result, the researcher hypothesized that, when examining student-teaching practicum evaluations, the evaluations would not be related to first-year elementary teacher proficiency. This hypothesis was not confirmed. The School Board's ranking of practicum evaluations was positively correlated, in the moderate effect size range, with first-year teacher proficiency. This variable was statistically significant at the 0.01 level and was included in the Discriminant Function Analysis.

It is important to note that, while the School Board's ranking of student-teaching practicum evaluations were positively related to first-year teacher proficiency (the higher the practicum rating the more proficient the teacher), when the means of the two groups were compared, the differences were less than one point apart. For example, the mean for the highly proficient first-year teacher group was 25.21 (with a range of 24-27) and the mean for the least proficient first-year teacher group was 24.31 (with a range of 22-26).

While the School Board's ranking of the practicum evaluations were positively related to first-year teacher proficiency, the difference between the means of the two groups was small and there was overlap in the ranges. In order to further investigate whether student-teaching practicum evaluations could discriminate highly proficient first-year teachers from least proficient first-year teachers, the actual student-teaching practicum evaluations were provided to the researcher as blind data. All identifying information as to whether the participants were from the highly proficient first-year teacher group or the least proficient first-year teacher group were removed. The researcher read through all of the student-teaching practicum evaluations and by relying on the cooperating teachers' final evaluation comments, attempted to discriminate who was from the highly proficient first-year teacher group and who was not. It was found that all of the student-teaching evaluations had a passing grade and all of the student-teaching evaluations had narrative comments that were positive. Out of the 40 evaluations read, there was not one negative comment. Because the comments from cooperating teachers were all positive in nature, it was difficult to recognize any of the evaluations as coming from the least proficient first-year teacher group. As a result, the researcher was only able to successfully predict group membership 52% of the time. The same percentage could have been reached by chance.

These findings support previous research by Brucklacher (1998), Knowles (1992), and Katz and Raths (1992). Bruchlacher examined 465 evaluations of student teachers using a 20-item instrument and reported that all of the ratings were above average on all items. He reported an overall mean score of 3.63 out of a possible four. Knowles (1998) stated that teacher educators are induced into supporting mediocre prospective teachers by assigning passing grades. Katz and Raths (1992) reported, "Some cooperating teachers will accept almost any level of student-teaching performance and reward the candidate with positive support and warm feedback" (p. 378).

In addition, not one of the practicum evaluations examined in this study had a failing grade, despite the fact that 20 of these individuals were deemed to be least proficient in their first year of teaching. While this is disturbing, the results are consistent with prior research conducted by Johnson and Yates (1982). They reported that 15% of universities never fail a student-teacher, 50% fail less that 1%, and 15% fail 1%.While the first study was done in 1982, the current findings of this research support that failure on practicum evaluations continues to be either non-existent or relatively low.

The practicum experience is one of the best ways a student can demonstrate competence. The results of this dissertation support the notion that student-teaching practicum evaluations are positively related to first-year teacher proficiency. However, this dissertation also indicated that if student-teaching practicum evaluations could better discriminate between the two groups, the relationship would be stronger as well. As a result, it is suggested that utilization of a graded system or the use of a Likert-type scale in practicum evaluations should be considered. Such grading systems provide ratings of performance based on a continuum. Narrative comments could be included after each performance area, but discrimination needs to be made when assigning a number or grade to each of the performance areas. Since this dissertation and previous research indicate that most cooperating teachers are overly positive in evaluating student-teaching performance, it would also be a recommendation that practicum evaluation forms have a section at the end in which the cooperating teacher must identify areas of strengths and areas for growth. Having a "place holder" for areas for growth may assist in obtaining more accurate information about performance.

In addition, making the student-teaching evaluation form more behaviourally specific, and educating cooperating teachers to use the instrument more objectively are crucial to the process. It would also be useful to create a system in which both the cooperating teacher and the faculty advisor complete a final evaluation on the student teachers' performance. Working with a faculty advisor would help the cooperating teacher understand how his/her student teacher compares with other student teachers. This collaborative evaluation process might increase the ability to differentiate student-teaching proficiency. Part of the reason cooperating teachers may over-rate their student teachers could possibly be because they only have one student, or have not supervised other student teachers, and thus comparisons cannot be made. Another reason for the inflated results may be because students often complain and object a great deal about their evaluation and, in some cases, appeal low ratings. Cooperating teachers already spend a great deal of time with a student teacher. To have them complain about their evaluation is an unpleasant circumstance that cooperating teachers may wish to avoid. Having the cooperating teacher and the faculty advisor use a behaviourally descriptive evaluation form and collaborate on the final evaluation, may result in more discriminating information on student-teaching performance.

Katz and Raths (1992) investigated the advantages and limitations of using rating scales on practicum evaluations. One advantage is that rating scales reduce ambiguity. Students view this as a positive factor simply because, when they know what is expected for proficiency, they work more diligently to meet expectations. Students view this type of assessment as being fair. Second, identifying specific observable teaching behaviours simplifies the evaluation process and guides cooperating teachers in providing appropriate classroom opportunities. In addition, rating scales and grades generate data for the further development of teacher education programs. Consistently lower grades or ratings, among a number of student-teachers, may highlight areas that require more emphasis. The major limitations of rating scales are that they often lack reliability because different evaluators interpret them in different ways (Gellman, 1992). This further highlights the importance of educating cooperating teachers in the evaluation of student-teaching performance.

Screening and Hiring Prospective Teaching Candidates

School Board administrators involved in selecting and hiring teachers are seeking the most qualified individual for each teaching position. The School Board in this study gathered information on teacher applicants in the following areas: overall grade point averages, student-teaching evaluations, the variety of university coursework completed, résumé/letters of reference/biographical information, the interview, and the overall ranking from all of the information examined. Information was gathered and recorded on a summary applicant sheet, which appears in Appendix D.

This dissertation examined each of the areas the School Board used to make screening and hiring decisions, to determine if relationships could be found between any of the screening and hiring variables and first-year teacher proficiency. Data were analysed using Pearson Correlation Coefficients. The overall university grade point average and the student-teaching evaluations are not included in this section, as they have already been reported in previous sections. The results indicated that the ranking of coursework variation and the résumé/letter of reference/biographical information had almost no relationship to first-year teacher proficiency. The only variable that had statistical significance at the 0.01 level was the final overall screening and hiring total score and, at the 0.05 level, the interview total score and the personal qualities score from the interview. These variables were in the moderate effect size range.

It is important to note that the personal qualities score from the interview and the final overall screening and hiring score, while statistically significant, were removed from consideration for use in the Discriminant Function Analysis. This was done because the personal qualities score was a subset of the total interview score and the final overall screening and hiring score included the interview total score. To include these variables would violate the assumption of independence. As a result, the interview total score was the only variable considered for inclusion in the Discriminant Function Analysis.

Since the interview total score showed a statistically significant relationship to first-year teacher proficiency, it is likely that the School Board's interview process is proficient and should remain in the screening and hiring process. The reason that this School Board's interview process appears to be proficient is that it is based on what prior research has indicated is important to include in the process. Literature in the area of screening and hiring practices highlighted that, for interviews to be an effective tool, the interview questions must be job relevant, the same questions must be asked of all applicants, and a system for recording and storing interview information is suggested. Seyfarth (1996) indicated that adhering to this type of system would assist school boards in avoiding bias, on the part of the interviewer, towards the prospective teaching candidate. In addition, the research literature suggests that interview validity can be increased by the use of behaviour-descriptive interviews (Janz, 1989). This process involves asking questions about events in which the applicant has actually been involved.

This dissertation examined all of the interview data collected by the School Board and it was determined that all of the interview criteria, noted above, were utilized in the interview process. The 17 questions asked of each candidate were job relevant (Appendix E). These questions were developed around the areas of knowledge, abilities/skills, attitudes, and personal qualities. A system for recording and storing interview responses was in place and each interviewer utilized behaviour-descriptive questions. In addition, the interview questions were accompanied by a list of indicators for possible correct answers.

The fact that statistically significant differences in the total interview score were observed between the highly proficient first-year teachers and the least proficient first-year teachers, confirms that the School Board's interview process has some validity. However, one suggestion would be that the school board considers adding a few more interview questions to determine a candidate's knowledge of Educational Psychology concepts, knowledge of how to teach language-arts to students, and knowledge/sensitivity towards diversity and special education issues.

Another area that was examined in the screening and hiring process was the use of references and their ability to differentiate first-year teacher performance. In the literature, there is debate over the value of references in the employee selection process. Some individuals support the importance of references as sources of information about job applicants (Aamodt, Bryan, & Whitcomb, 1993; Watts, 1993), while others question their validity because only positive information is highlighted (Seyfarth, 1996). In this dissertation, when the reference/biographical information was examined, it was negatively related to first-year teacher proficiency. This suggests that references, on average, are not a valid or reliable predictor of first-year teacher proficiency.

Discriminant Function Analysis and the Development of a Predictive Screening and Hiring Model

As reported above, 11 independent variables, previously identified as having a statistically significant relationship to first-year teacher proficiency, were included in the Discriminant Function Analysis. These variables are listed below in Table 14. These 11 variables, alone, provide insight for school boards in terms of which pre-service variables should be included in their screening and hiring practices. However, when these variables are examined together, their potential for predicting which teachers will be highly proficient in their first year of teaching, and which teachers will be least proficient, increases substantially. Teaching is a complex activity that is influenced by the interaction of many variables. Therefore, in order to account for the complexities that are at the heart of education, it was important to examine the relationships among all of the statistically significant variables to begin to develop a predictive model.

Table 14

11 variables included in the discriminant function analysis and used in the development of a predictive model for first-year teacher proficiency

Subject Matter Variables

1. Language/Literature GPA
2. Mathematics GPA
3. Natural Sciences GPA
4. The number of Social Sciences courses completed

Education/Methodology Variables

5. The GPA in the required Mathematics Methodology course
6. The GPA in the required Reading Methodology course
7. The number of Educational Psychology courses completed
8. The completion of an Educational Psychology Assessment course
9. The GPA in the last session of University

Screening and Hiring

10 The Interview Total Score assigned by the School Board

11 The Practicum Evaluation rating assigned by the School Board

The 11 variables identified in Table 14 encompass the one canonical discriminant function that described first-year teacher proficiency group membership. The canonical discriminant function is a linear combination of all of these 11 independent variables.

The information obtained from the discriminant function analysis allowed the researcher to construct a probability of group membership logarithmic equation. School boards could use this logarithmic equation by entering the discriminant function coefficients and the actual scores from the 11 variables, to determine least proficient or highly proficient group membership. Furthermore, a probability of group membership logarithmic equation was developed, to determine the probability that a teaching candidate will be in the least proficient or highly proficient first-year teacher group.

Despite the potentially enormous benefits of predicting first-year teacher proficiency, academic research in the area to date has been sparse. However, the new empirical methodology proposed in this dissertation has made significant headway in the predictive efficacy of first-year teacher proficiency. In this dissertation, using a limited but experimentally sound sample, a 92.9% prediction rate was obtained in correctly predicting whether a teacher would be highly proficient or least proficient in his/her first year of teaching.

The results of this research study represent significant benefits to school boards in that teacher personnel selection decisions can be enhanced through the use of the predictive statistical model developed in this study. This predictive statistical model has the potential to identify teachers early in the hiring process, who would have a high probability of being least proficient first-year teachers. In a similar manner, this statistical model would have the capacity to identify teachers who have a high probability of being highly proficient first-year teachers. By entering information regarding each teacher into the equation, a discriminant score is produced for each teacher. In other words, this model can identify outliers at either end of the teaching proficiency spectrum.

The results of this study are highly relevant and important to school boards. For example, applicants who had an extremely high probability of not being proficient as first-year teachers could be eliminated from the applicant pool, early in the hiring process. If even a few least proficient teachers are potentially identified and not hired as a result of the predictive model described in this study, fewer children run the increased risk of academic failure. In addition, the cost savings of the salaries of those teachers (not to mention the human resource hours, benefits, and other financial considerations associated with hiring a potentially least proficient candidate) would have a positive impact on a school board.

Clearly, however, implementation of a predictive personnel selection model of this type would have limitations. For example, the predictive model performs well in identifying extreme cases (e.g., teachers that would be least proficient and teachers that would be highly proficient) but have less sensitivity in discriminating within the middle range of teacher proficiency. Therefore, a predictive model of this type would need to be used in conjunction with existing teacher personnel selection practices.

It is also important to note that the analysis conducted in this study is based on a small sample size. In order to generalize these results, additional research would be required which utilized larger, more complete data sets. However, as a general approach to augment and improve teacher selection practices for school boards, this methodology can be used as the initial building block on which more complex and rigorous predictive investigations can be based. This is not to say that the Discriminant Function reported in this study is not of use. It is likely, that within the School Board from which the data for this study came, and perhaps other school boards, the Discriminant Function Analysis equation would predict with great accuracy, extreme cases in either group (i.e., the highly proficient first-year teachers and the least proficient first-year teachers).

It is also important to note that the specific set of predictor variables, and weightings of each variable, may vary from school board to school board. Therefore, school boards would be wise to conduct their own Discriminant Function Analysis using data gathered from within their specific school board, using methodology similar to that outlined in this study.

The next steps would be for the School Board involved in this study to examine the predictive validity of the model by applying it to present and future teachers (used as part of human resource selection), tracking the effectiveness of the model over time (tracking teacher performance and relating it back to the predictive model), and fine-tuning the model to improve prediction.

Limitations of the Study

This study provided insights into variables that were related to first-year teacher proficiency and subsequently used in the development of a predictive model for first-year teacher proficiency. However, the conclusions should be interpreted with caution due to the following limitations of the study.

1. The sample size in this study was small, and it is therefore difficult to generalize extensively. That there were missing data further complicated this issue.
2. This study was limited by the fact that first-year teacher proficiency was measured by classroom observations completed by the principal. Using student achievement as an additional indicator to determine first-year teacher proficiency would have further strengthened this study.
3. Policies outlined in the Freedom of Information and Protection of Privacy Act (FOIPP) limited this study. To guarantee the confidentiality and anonymity of the

participants, it was essential that the data be provided to the researcher with all identifying information removed. Such being the case, no involvement or contact could be made with the participants. As a result, follow-up interviews could not occur. Having the ability to ask participants clarifying question would have provided valuable qualitative information that would have enriched both the findings and conclusions of this study. Interviewing teachers from the highly proficient and least proficient sample groups may have provided additional information with respect to attitudes, beliefs, supports, and challenges that contributed to first-year teaching performance.

Future Research

Although the sample size in this study was small and therefore difficult to generalize from, the predictive potential of the analysis is difficult to ignore. If it were possible to analyze more data (i.e., at a large district level) related to first-year teacher proficiency, it might be possible to develop even more robust predictive methods that could be invaluable in the teacher personnel selection process.

Another area that could be further researched would be to examine, in-depth, the specific types and levels of Social Science courses and Educational Psychology courses that the highly proficient first-year teacher group completed. This dissertation only examined the number of courses that were completed in each of these areas and the GPAs received. Further research is required to know which specific courses contributed to the proficiency of a first-year teacher. Such research could assist universities in developing a teacher preparation program that includes mandated courses that are necessary and sufficient in ensuring proficient first-year teaching.

Further research on practicum evaluations would be beneficial. An evaluation tool that uses behaviourally specific performance indicators to evaluate student-teaching performance, coupled with a process by which cooperating teachers are educated to use this evaluation tool, could be developed. The effectiveness of the student evaluation tool and process could then be studied to determine if it can successfully discriminate student-teaching performance.

Lastly, it would be beneficial if a qualitative study could be developed to complement this quantitative study. Interviews of highly proficient and least proficient first-year teachers may provide us with insights into what additional factors contributed to the success or failure of each first-year teacher. Factors could include information related to the following:

- When students enter teacher education programs, their attitudes and beliefs serve as filters for what they learn about diversity and inclusion. These dispositional factors may be significant because they may determine prospective teachers' readiness (or lack thereof) to learn from educational experiences. Although multicultural and educational psychology courses certainly are important tools for developing students' awareness and sensitivity, by themselves they may be insufficient to counteract the power of pre-existing attitudes and beliefs. A study that examines proficient and non-proficient first-year teachers' beliefs and attitudes about diversity and inclusion may be beneficial.
- Interviewing highly proficient and least proficient first-year teachers to examine how the type of experiences provided in the student-teaching practicum affected their performance would be beneficial. Finding more information about the kind

of classroom environments in which first-year teachers can most successfully demonstrate the skills they have learned in their teacher preparation coursework would be useful.

- Interviewing highly proficient and least proficient first-year teachers to identify the supports and challenges they faced that contributed to their first-year teaching performance would be beneficial.

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Appendix A

Teaching Quality Standard (Alberta Government, 1997).

(1) Teaching Quality Standard

Quality teaching occurs when the teacher's ongoing analysis of the context, and the teacher's decisions about which pedagogical knowledge and abilities to apply result in optimum learning by students.

All teachers are expected to meet the Teaching Quality Standard throughout their careers. However, teaching practices will vary because each teaching situation is different and in constant change. Reasoned judgment must be used to determine whether the Teaching Quality Standard is being met in a given context.

(2) Descriptors of Knowledge, Skills and Attributes Related to Interim Certification

Teachers who hold an Interim Professional Certificate must possess the Knowledge, Skills and Attributes Related to Interim Certification (Interim KSAs), and apply them appropriately toward student learning. During their first two years of teaching, teachers should use the Interim KSAs to guide their teaching, reflect on their practice, and direct their professional development in collaboration with their supervisors and evaluators.

As situations warrant, teachers who hold an Interim Professional Certificate are expected to demonstrate consistently that they understand:

a) contextual variables affect teaching and learning. They know how to analyse many variables at one time, and how to respond by making reasoned decisions about their teaching practice and students' learning;

b) the structure of the Alberta education system. They know the different roles in the system, and how responsibilities and accountabilities are determined, communicated and enforced, including the expectations held of them under the Certification of Teachers Regulation, A.R. 261/90 as amended and their school authority's teacher's evaluation policy;

c) the purposes of the Guide to Education and programs of study germane to the specialization or subject disciplines they are prepared to teach. They know how to use these documents to inform and direct their planning, instruction and assessment of student progress;

d) the subject disciplines they teach. They have completed a structured program of studies through which they acquired the knowledge, concepts, methodologies and assumptions in one or more areas of specialization or subject disciplines taught in Alberta schools;

e) all students can learn, albeit at different rates and in different ways. They know how (including when and how to engage others) to identify students' different learning styles and ways students learn. They understand the need to respond to differences by creating multiple paths to learning for individuals and groups of students, including students with special learning needs;

f) the purposes of short, medium and long term range planning. They know how to translate curriculum and desired outcomes into reasoned, meaningful and incrementally progressive learning opportunities for students. They also understand the need to vary their plans to accommodate individuals and groups of students;

g) students' needs for physical, social, cultural and psychological security. They know how to engage students in creating effective classroom routines. They know how and when to apply a variety of management strategies that are in keeping with the situation, and that provide for minimal disruptions to students' learning;

h) the importance of respecting students' human dignity. They know how to establish, with different students, professional relationships that are characterized by mutual respect, trust and harmony;

i) there are many approaches to teaching and learning. They know a broad range of instructional strategies appropriate to their area of specialization and the subject discipline they teach, and know which strategies are appropriate to help different students achieve different outcomes;

j) the functions of traditional and electronic teaching/learning technologies. They know how to use and how to engage students in using these technologies to present and deliver content, communicate effectively with others, find and secure information, research, word process, manage information, and keep records;

k) the purposes of student assessment. They know how to assess the range of learning objectives by selecting and developing a variety of classroom and large scale assessment techniques and instruments. They know how to analyse the results of classroom and large scale assessment instruments including provincial assessment instruments, and how to use the results for the ultimate benefit of students;

l) the importance of engaging parents, purposefully and meaningfully, in all aspects of teaching and learning. They know how to develop and implement strategies that create and enhance partnerships among teachers, parents and students;

m) student learning is enhanced through the use of home and community resources. They know how to identify resources relevant to teaching and learning objectives, and how to incorporate these resources into their teaching and students' learning;

n) the importance of contributing, independently and collegially, to the quality of their school. They know the strategies whereby they can, independently and collegially, enhance and maintain the quality of their schools to the benefit of students, parents, community and colleagues;

o) the importance of career-long learning. They know how to assess their own teaching and how to work with others responsible for supervising and evaluating teachers. They know how to use the findings of assessments, supervision and evaluations to select, develop and implement their own professional development activities;

p) the importance of guiding their actions with a personal, overall vision of the purpose of teaching. They are able to communicate their vision, including how it has changed as a result of new knowledge, understanding and experience; and

q) they are expected to achieve the Teaching Quality Standard.

(3) Descriptors of Knowledge, Skills and Attributes Related to Permanent Certification

Teachers who hold a Permanent Professional Certificate must demonstrate, in their practice, professional repertoires that are expanded beyond the Interim KSAs.

The following descriptors comprise a repertoire of selected knowledge, skills and attributes from which teachers who hold a Permanent Professional Certificate should be able to draw, as situations warrant, in order to meet the Teaching Quality Standard.

Teachers, staffs, supervisors and evaluators should use the descriptors to guide professional development, supervision, evaluation and remediation strategies in order that teachers can meet the Teaching Quality Standard consistently throughout their careers.

a) Teachers' application of pedagogical knowledge, skills and attributes is based in their ongoing analysis of contextual variables.

Teachers' analysis of contextual variables underlies their reasoned judgments and decisions about which specific pedagogical skills and abilities to apply in order that students can achieve optimum learning. Selected variables are outlined below.

student variables

- demographic variables, e.g. age, gender
- maturation
- abilities and talents
- relationships among students
- subject area of study
- prior learning
- socio-economic status
- cultural background
- linguistic variables
- mental and emotional states and conditions

regulatory variables

- *Government Organization Act*
- *School Act* and provincial regulations, policies and Ministerial Orders
- *Child Welfare Act*
- *Canadian Charter of Rights and Freedoms*
- school authority policies
- Guide to Education
- programs of study

school variables

- resource availability and allocation
- teaching assignment
- class size and composition
- collegial and administrator support
- physical plant
- physical plant

teacher variables

- teaching experience
- learning experiences

parent and societal variables

- parental support
- parental involvement in children's learning
- socio-economic variables
- community support for education
- multiculturalism
- cultural pluralism
- inter-agency collaboration
- provincial, national and global influences

b) Teachers understand the legislated, moral and ethical frameworks within which they work.

Teachers function within a policy-based and results oriented education system authorized under the School Act and other legislation.

Teachers also function within policy frameworks established by school authorities. This includes policies which require: a commitment to teaching practices that meet their school authority's teaching quality standard(s); and that teachers engage in ongoing, individualized professional development.

Teachers recognize they are bound by standards of conduct expected of a caring, knowledgeable and reasonable adult who is entrusted with the custody, care or education of students or children. Teachers recognize their actions are bound in moral, ethical and legal considerations regarding their obligations to students, parents, administrators, school authorities, communities and society at large. Teachers acknowledge these obligations and act accordingly.

c) Teachers understand the subject disciplines they teach.

Teachers understand the knowledge, concepts, methodologies and assumptions of the subject disciplines they teach. This includes an understanding of how knowledge in each discipline is created and organized, and that subject disciplines are more than bodies of static facts and techniques - they are complex and evolving. Their understanding extends to relevant technologies, the linkages among subject disciplines, and their relevance and importance in everyday life at the personal, local, national and international levels. Teachers understand that students typically bring preconceptions and understandings to a subject. They know strategies and materials that are of assistance in furthering students' understanding.

d) Teachers know there are many approaches to teaching and learning.

Teachers appreciate individual differences and believe all students can learn, albeit at different rates and in different ways. They recognize students' different learning styles and the different ways they learn, and accommodate these differences in individuals and groups of students including students with special learning needs.

Teachers understand the fluidity of teaching and learning. They constantly monitor the effectiveness and appropriateness of their practices and students' activities, and change them as needed.

e) Teachers engage in a range of planning activities.

Teachers' plans are founded in their understanding of contextual variables and are a record of their decisions on what teaching and learning strategies to apply. Plans outline a reasoned and incremental progression toward the attainment of desired outcomes, for both teachers and students. Teachers monitor the context, their instruction, and monitor and assess students' learning on an ongoing basis, and modify their plans accordingly. Teachers strive to establish candid, open and ongoing lines of communication with students, parents, colleagues and other professionals, and incorporate information gained into their planning.

f) Teachers create and maintain environments that are conducive to student learning.

Teachers establish learning environments wherein students feel physically, psychologically, socially and culturally secure. They are respectful of students' human dignity, and seek to establish a positive professional relationship with students that is characterized by mutual respect, trust and harmony. They model the beliefs, principles, values, and intellectual characteristics outlined in the Guide to Education and programs of study, and guide students to do the same.

Teachers work, independently and cooperatively, to make their classrooms and schools stimulating learning environments. They maintain acceptable levels of student conduct, and use discipline strategies that result in a positive environment conducive to student learning. They work with students to establish classroom routines that enhance and increase students' involvement in meaningful learning activities. They organize facilities, materials, equipment and space to provide students equitable opportunities to learn, and to provide for students' safety.

Where community members work with students either on-campus or off-campus and where students are engaged in school-sponsored off-campus activities, teachers strive to ensure these situations also are secure and positive environments conducive to students' learning.

g) Teachers translate curriculum content and objectives into meaningful learning activities.

Teachers clearly communicate short and long range learning expectations to students, and how the expectations are to be achieved and assessed. They engage students in meaningful activities that motivate and challenge them to achieve those expectations. They integrate current learning with prior learning, and provide opportunities for students to relate their learning to the home, community and broader environment.

Teachers apply a broad range and variety of instructional and learning strategies. The strategies vary in keeping with contextual variables, subject content, desired objectives, and the learning needs of individuals and groups of students. The strategies are selected and used to achieve desired outcomes, primarily the expectations outlined in the Guide to Education, programs of study and other approved programs.

h) Teachers apply a variety of technologies to meet students' learning needs.

Teachers use teaching/learning resources such as the chalkboard, texts, computers and other auditory, print and visual media, and maintain an awareness of emerging technological resources. They keep abreast of advances in teaching/learning technologies and how they can be incorporated into instruction and learning. As new technologies prove useful and become available in schools, teachers develop their own and their students' proficiencies in using the technologies purposefully, which may include content presentation, delivery and research applications, as well as word processing, information management and record keeping.

Teachers use electronic networks and other telecommunication media to enhance their own knowledge and abilities, and to communicate more effectively with others.

i) Teachers gather and use information about students' learning needs and progress.

Teachers monitor students' actions on an ongoing basis to determine and respond to their learning needs. They use a variety of diagnostic methods that include observing students' activities, analysing students' learning difficulties and strengths, and interpreting the results of assessments and information provided by students, their parents, colleagues and other professionals.

Teachers select and develop a variety of classroom assessment strategies and instruments to assess the full range of learning objectives. They differentiate between classroom and large-scale instruments such as provincial achievement tests, administer both and use the results for the ultimate benefit of students. They record, interpret and use the results of their assessments to modify their teaching practices and students' learning activities.

Teachers help students, parents and other educators interpret and understand the results of diagnoses and assessments, and the implications for students. They also help students develop the ability to diagnose their own learning needs and to assess their progress toward learning goals.

Teachers use their interpretations of diagnoses and assessments as well as students' work and results to guide their own professional growth. They assist school councils and members of the community to understand the purposes, meanings, outcomes and implications of assessments.

j) Teachers establish and maintain partnerships among school, home and community, and within their own schools.

Teachers engage in activities that contribute to the quality of the school as a learning environment. They work with others to develop, coordinate and implement programs and activities that characterize effective schools. They also work cooperatively with school councils.

Teachers strive to involve parents in their children's schooling. Partnerships with the home are characterized by the candid sharing of information and ideas to influence how teachers and parents, independently and cooperatively, contribute to students' learning. Teachers seek out and incorporate community resources into their instruction, and encourage students to use home and community resources in their learning. Teachers make connections between school, home and community in order to enhance the relevance and meaning of learning. Home and community resources are utilized to make learning meaningful and relevant, and so students can gain an increased understanding of the knowledge, skills and attitudes needed to participate in and contribute positively to society.

k) Teachers are career-long learners.

Teachers engage in ongoing professional development to enhance their: understanding of and ability to analyze the context of teaching; ability to make reasoned judgments and decisions; and, pedagogical knowledge and abilities. They recognize their own professional needs and work with others to meet those needs. They share their professional expertise to the benefit of others in their schools, communities and profession.

Teachers guide their actions by their overall visions of the purpose of teaching. They actively refine and redefine their visions in light of the ever-changing context, new knowledge and understandings, and their experiences. While these visions are dynamic and grow in depth and breadth over teachers' careers, the visions maintain at their core a commitment to teaching practices through which students can achieve optimum learning.

Appendix B

Social Sciences-Description of Courses

Anthropology	Economics	History	Political Science	Sociology
ANTHR 101 Introductory Anthropology ANTHR 110 Gender, Age, and Culture ANTHR 150 Race and Racism in the Modern World ANTHR 207 Introduction to Social and Cultural Anthropology ANTHR 208 Introduction to Linguistic Anthropology ANTHR 250	ECON 101 Introduction to Microeconomics ECON 102 Introduction to Macroeconomics ECON 204 Principles of Economics ECON 211 Chinese Economic Development ECON 213 An Introduction to the Economics of Developing Countries ECON 323	HIST 110 The Pre-Modern World HIST 113 War and Peace in World History HIST 114 The History of the World in the Last 10 Years HIST 118 Sexualities and Gender in History HIST 271 Social and Economic History HIST 272	POL S 101 Introduction to Politics POL S 110 Politics of Globalization POL S 200 Introduction to Comparative Politics POL S 220 Canadian National Government and Politics POL S 221 Canadian Political Realities POL S 260	SOC 100 Introductory Sociology SOC 102 Social Problems SOC 224 Sociology of Deviance and Conformity SOC 231 Introduction to Theories of Society SOC 241 Social Psychology SOC 260 Inequality and Social

North American Aboriginal Peoples	International Economics	Religion in History	International Relations	Stratification
ANTHR 261 Peoples and Cultures of Middle America ANTHR 310 The Anthropology of Gender ANTHR 322 Anthropological Perspectives on Human Communication ANTHR 437 Language, Ethnicity, and Nationalism	ECON 350 The Economics of Public Expenditures ECON 410 Pacific Rim Economic Development ECON 412 European Economic Development ECON 414 Economics of Developing Countries	HIST 273 Cultural Studies in History HIST 274 Gender in History	POL S 306 Rights, Equality and Democracy POL S 327 Aboriginal Peoples and the Canadian State POL S 350 The Politics of Gender POL S 434 Cities and Globalization	SOC 301 Sociology of Gender SOC 321 Youth, Crime and Society SOC 345 Cultural Studies SOC 368 Canadian Ethnic and Minority Relations SOC 370 Racism and Decolonization SOC 453 The Urban Community

Appendix C

Educational Psychology - Samples of Undergraduate Courses

EDPY 200 Educational Psychology for Teaching

EDPY 301 Inclusive Education: Adapting Instruction for Students with Special Needs

EDPY 303 Educational Assessment

EDPY 397 Educational Psychology Seminars

EDPY 402 Child Development for Educators

EDPY 404 Adolescent Development for Educators

EDPY 410 Individual Differences in Education

EDPY 416 Introduction to the Teaching of English as a Second Language

EDPY 418 Methods and Programs Teaching of English as a Second Language to Adults

EDPY 432 Interpersonal Communication for Teachers

EDPY 442 Introduction to Counselling

EDPY 452 Assessment and Instruction of Exceptional Learners

EDPY 456 Consultation and Collaboration in Special Education

EDPY 458 Assessment and Programming for Children with a Specific Reading Disability

EDPY 468 Individualizing Instruction for Adolescents with Special Needs

EDPY 470 Deafness: An Introduction and Survey

EDPY 472 Introduction to Language Development

EDPY 474 Basic Manual Communication

EDPY 478 Psychology and Education of Gifted Children

EDPY 499 Directed Individual Study in Educational Psychology

Appendix D

School Board's Screening and Hiring Summary Sheet

Overall University GPA 5.1-5.3 = 5 6.0-6.2 = 8 6.9-7.1 = 11 7.8-8.0 = 14 5.4-5.6 = 6 6.3-6.5 = 9 7.2-7.4 = 12 8.1-9.0 = 15 5.7-5.9 = 7 6.6-6.8 = 10 7.5-7.7 = 13	Total Score/15
Course Work Range in Course Selection: 1 2 Progressive Academic Improvement: 1 Achievement in Significant Courses: 1 2	Total Score/5
Teaching Reports 1 2 3 4 5 X 6	Total Score/30
Resumé/Reference/Biographical Information 1 2 3 4 5 X 2	Total Score/10
Interview Score	Total Score/40
Total Screening and Hiring Score	Total Score/100

Appendix E

Teacher Interview Questions

1. Tell me what motivated you to become a teacher in the first place?
2. If I limited you to three qualities, what would you tell me should be the three most important qualities of a truly fine teacher?
3. In planning, how do you think you might plan your lessons so the needs of students with different abilities, different preferences, different learning styles, different motivations and different priorities can all somehow be accommodated?
4. In managing your classroom how do you think you might go about establishing rules, procedures and routines?
5. From all strategies you have ever heard about or read about, seen demonstrated, tried yourself…tell me about one or two teaching strategies you believe are particularly suited to who you are/the kind of teacher you would like to be/the kind of relationship you would like to have with students. What works for you?
6. There are two parts to this question: First, tell me briefly about how you plan to go about evaluating and reporting student progress and then, secondly, tell me about how you think you might use this assessment data for your own purposes as you continue to organize and plan for student achievement? (How are you going to get the information and how are you going to use it)?
7. If I come into your classroom on a typical day, what would I probably see? What might I see you doing? What might I see students doing? What might I see as I look around the room?
8. Regardless of the activities you plan and try to present, there always seem to be

two or three students who will continue to talk amongst themselves, continue to distract each other as well as possibly others in the class, take your focus away from where you want it to be, and just generally be the kind of student you might be tempted to label as "only being there to drive you crazy." What specific actions might you take with this kind of behaviour?

9. You note that a student who is not being very successful in one of your classes is starting to withdraw completely by no longer participating, no longer handing in assignments, and no longer reporting in on a regular basis. What do you think you might do to intervene in this circumstance?
10. What kinds of things do you believe you do to motivate students?
11. How will you monitor your own teaching performance? How will you know when you are doing a terrific job?
12. What might be three goals you would want to accomplish by the end of a school year?
13. You come up with what you consider to be a terrific idea - one you believe could have a profoundly positive impact on student achievement at your school. How do you think you might attempt to gain support for your idea?
14. What strategies might you suggest to better involve parents as partners in learning?
15. What extra curricular activities might you be willing to volunteer to assist with or initiate in a school?
16. Tell me about professional development – either an opportunity you might already have enjoyed and found significant or some plan you might have for

future improvement of your professional skills?

17. Please summarize the characteristics or strengths you believe you have that will help make you an effective teacher for our district.